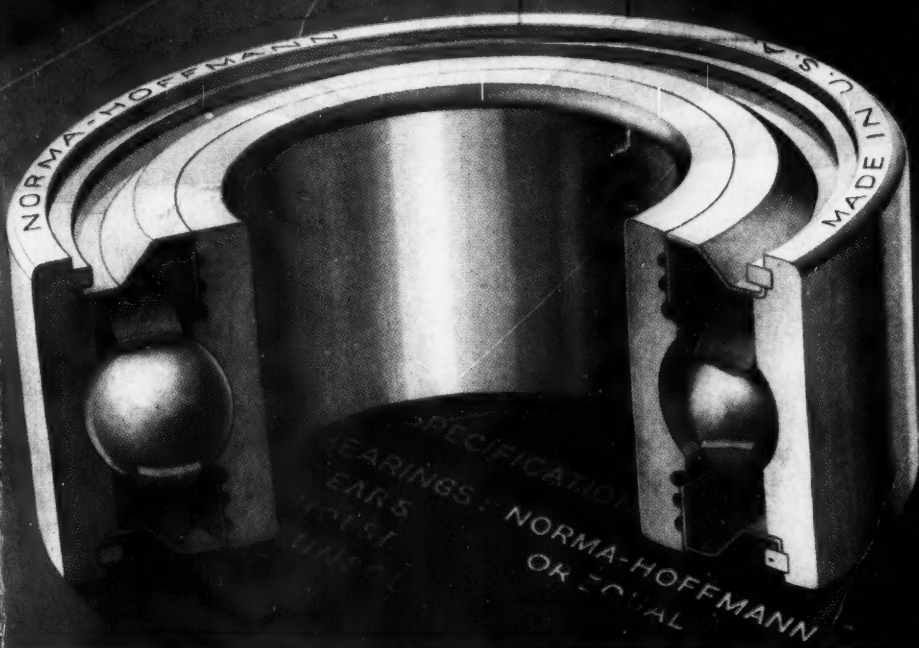


MODERN
Machine Shop



OCTOBER
1958



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Leading manufacturers endorse the patented Norma-Hoffmann "Cartridge" Bearing because it is unequalled for continuous performance and long operating life.

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GORTON
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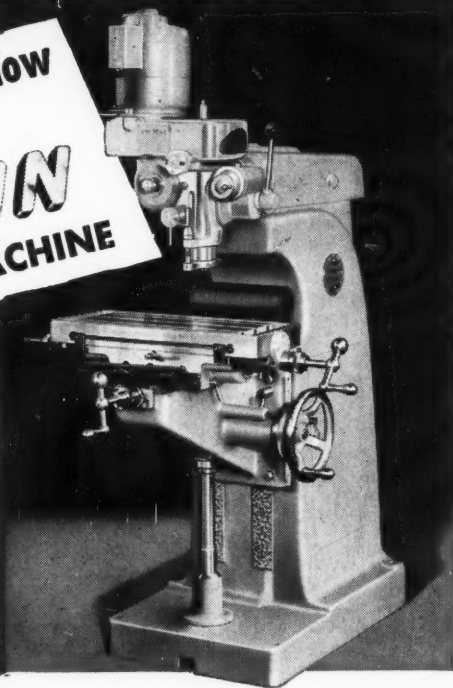
ANNOUNCING THE NEW
**O-16A SUPER-SPEED
MILLING MACHINE**

Indispensable in the Tool Room
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eral Engraving, Brass Routing, Die and
Mold Duplicating

This new O-16A *Gorton Super-Speed mill in-
corporates all of the features necessary in an
"all purpose" machine. It will do a better
job for you on any work within the limits
of its size.

The Gorton O-16A is rugged. It is designed for
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speeds from 300 to 10,000 R.P.M. available.
1/2 H.P. motor.

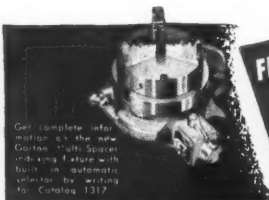
*Trade Mark Reg. U. S. Pat. Office



**DESIGNED FOR VERSATILE DUTY—
Check These Features**

Heavy column, adjustable ram, super-speed spin-
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head, positive spindle brake, spindle lock, quill
lock, depth stop graduated in thousandths, mi-
crometer and lever feed on spindle.

Adaptable for . . .
. . . General engraving and brass routing by
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attachments . . . Die and mold duplicating
by adding tracer head and dupli-
cator table.



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Milling Machine with
built-in automatic
feeder by writing
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Milling Machine with built-in
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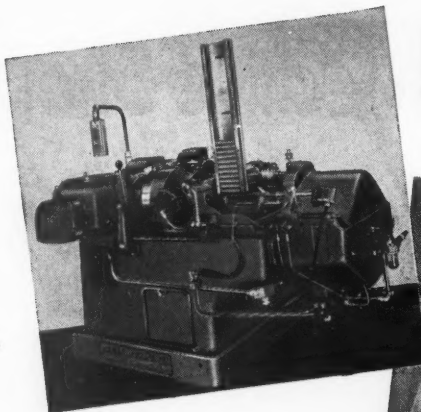
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Fewer Work Stoppages

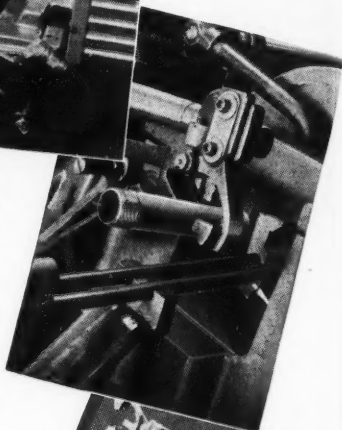
WITH THE **LANDIS** **AUTOMATIC** **NIPPLE** **MACHINE**

- **New Transfer Mechanism Allows Longer Running Time**

The operation cycle, in which both ends of nipples are threaded, reamed, and chamfered, is completely automatic. During operation, the operator must only give the machine visual attention and keep the magazine filled.

Blanks are released automatically from the magazine into the left-hand carriage, and fed into the die head at a rate equal to the lead of the thread being cut. Mechanical fingers pick up the semi-finished nipple and turn it end-for-end. The blank is placed on the work-rest bar of the right-hand carriage, and pushed into position for the operations on the unfinished end. Finished nipples are ejected automatically. Simultaneous with the operations on the right-hand carriage, a second blank is beginning the operation cycle on the left-hand carriage.

Write for Insert to Bulletin D-84.



PRODUCTION INCREASED 170%



and costs cut 63¢ on the dollar

...with a

NEW Heald Bore-Matic

That's the actual production record of a leading washing machine manufacturer. When a new Heald Model 222 Bore-Matic took over the job of finishing gear cases, production went up 170 per cent — and costs came down 63 per cent!

Five holes are precision bored, faced and chamfered in a single setting, obtaining close accuracy for spacing and eliminating several operations and setups previously required.

Easy, convenient operation, combined with a fast hydraulic fixture and rapid cycle, enable an operator to run this Bore-Matic and also a drill used for a previous operation.

Perhaps you don't have a job exactly like this one — but you do have the same opportunity to reduce costs, increase production and improve quality with the new Heald Bore-Matics. For further information on these outstanding new machines, we invite you to contact your nearest Heald representative or Worcester direct.



THE HEALD MACHINE COMPANY, Worcester 6, Mass.

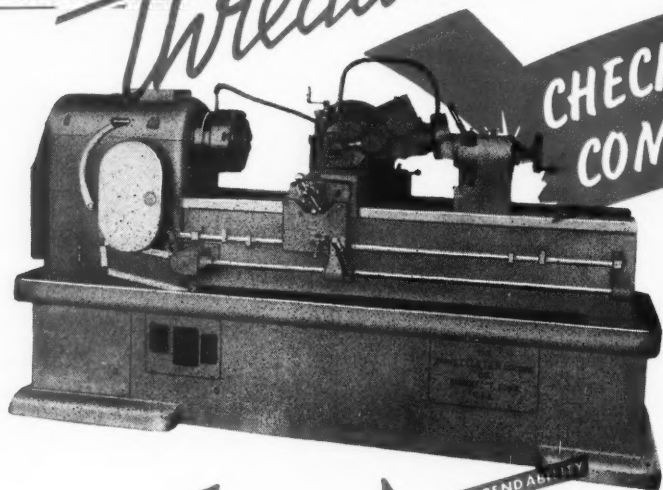
Branch Offices in Chicago • Cleveland • Dayton • Detroit • Indianapolis • Lansing • New York

Heald
Model 222
Bore-Matic

NEW BORE-MATIC FEATURES CAN HELP DO A BETTER JOB ON YOUR WORK, TOO

Faster table traverse, higher speeds, constant feeds, low temperature hydraulic system, cool running heads, perfected way lubrication, leak proof piping, and other new features can help you do a better job, faster, and at less cost. They're worth investigating.

PRESENTING THE NEW COULTER



**CHECK and
COMPARE**

* Here at last! The Conventional type Thread Milling Machine that produces long and short precision traversing elevating cross-feed and lead screws in **LESS TIME!**

Get the whole story today . . . then **CHECK and COMPARE.** It's **COULTER** all the way!



the James
COULTER
machine Co.

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Anti-Friction Bearings and Spiral and Worm Gears in Cutter Spindle Drive.

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These are reasons enough why you need the Coulter **THREADMASTER** . . . the Thread Milling Machine of tomorrow . . . threading it better and faster, today!

BRIDGEPORT, CONNECTICUT

The hardest-working gears you can buy:

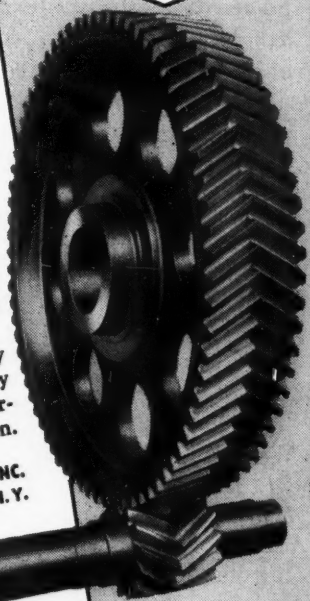
THE GEAR
WITH A
BACKBONE

The *backbone* in Farrel continuous tooth herringbone gears, formed by the meeting of the two helices without a useless center groove, puts the *entire* face width of the gear to work for you.

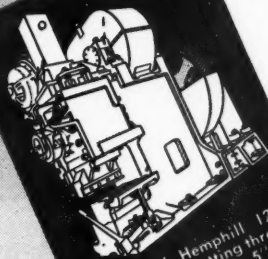
This provides extra strength and greater capacity for wear and shock resistance — especially important in heavy duty machine applications like these. The opposed helices balance and absorb axial thrust within the gear member, preventing harmful thrust loads with resultant stresses on other parts of the machinery.

The *Gear with a Backbone* is made in any size up to 20 feet in diameter, for practically any application. Information and engineering assistance available, without obligation.

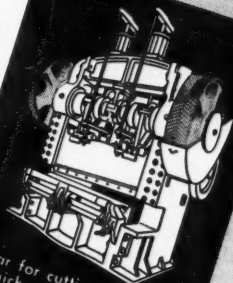
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Shear for cutting mild steel
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by Thomas Machine Manu-
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Farrel-Birmingham

FB-431

Who says:
"A TAP IS A TAP?"



We can't go along with that statement. It's like saying, "A book is a book" . . . (or, closer to home) "A machinist is a machinist."

If you believe that all engineers, machinists, machines, steels, coolants, inspectors, etc. are alike . . . then you might say, "A tap is a tap." But at Hanson-Whitney we know better. So do the thousands of buyers of H-W Taps . . . many of whom have been repeating customers since we

pioneered the "finished" tap . . . threads ground after hardening.

H-W Taps are the result of the closest control over materials, men, and machines . . . control that has been evolved through many years of leadership in supplying the right tap for the specific job.

So . . . let's not say, "A tap is a tap" . . . let's say an H-W Tap is a tap of the highest quality, measured, of course, by the number of holes tapped per grind.

HANSON-WHITNEY MACHINE CO. HARTFORD 2, CONN.
Division of Whitney-Hanson Industries, Inc.

**Hanson
Whitney**

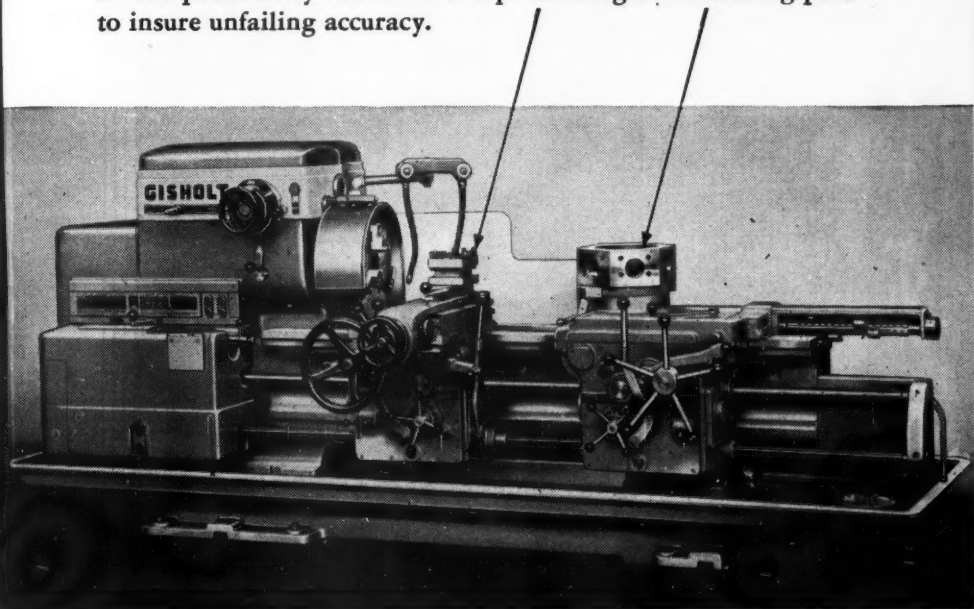
For practical recommendations submit your problems to Hanson-Whitney engineers.

PIONEERS OF FINISHED TAPS

RIGID TURRETS!

—for Rigid Standards of Accuracy!

It's one of the reasons why seasoned production men insist on Gisholt. The square turret tool post and hexagon turret are positioned by double-beveled clamping rings which provide exceptional clamping pressure with easy hand motion. Moreover, on each indexing operation, turret faces are rigidly locked in true position by hardened and precision-ground locking pins to insure unfailing accuracy.



GISHOLT ACCURACY is further enhanced by a heavy unit-cast head stock and bed which insures real rigidity. Bedways of hardened steel (64-66 Rockwell C) are ground in perfect alignment with the spindle. And they are virtually wear-proof. If you want accuracy, insist on Gisholt.

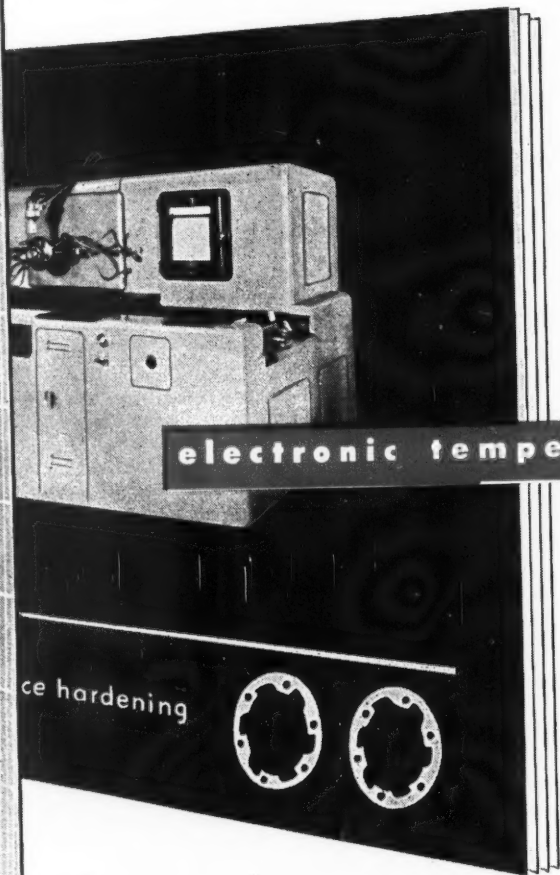
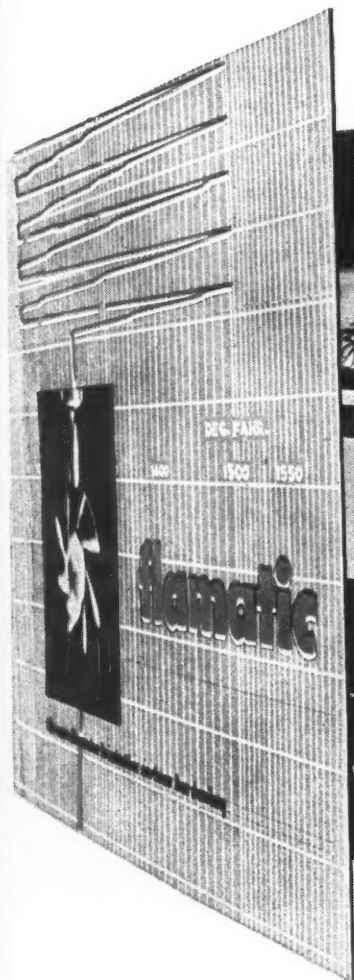
GISHOLT MACHINE COMPANY
Madison 10, Wisconsin

THE GISHOLT ROUND TABLE represents the collective experience of specialists in machining, surface-finishing and balancing of round and partly round parts. Your problems are welcomed here.





thousands will learn the meaning th



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the new dimension in
selective service hardening

flamatic exhibit

Whether you make, buy, process, or use heat treated parts, join the thousands who will see the Cincinnati

Flamatic Exhibit at the Metal Show - featuring two difficult surface hardening jobs in actual production:

- cams for automatic torque converter transmissions
- take-off drive shafts for gear reduction units.

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apply Flamatic to your requirements . . . Don't miss the Show! Don't miss Flamatic!

* Write for special Show Booklet, "The New Dimension in Selective Surface Hardening."



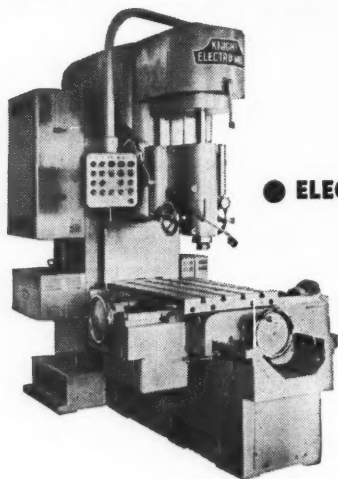
THE CINCINNATI MILLING MACHINE CO.

Cincinnati 9, Ohio, U.S.A.

NEW!

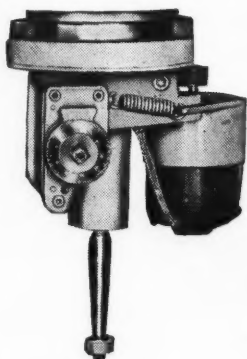
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Efficiently, economically handles large capacity work of many types: jigs, metal patterns, multi-cavity molds, jig boring with dial indicator, drilling, milling, machining light metals, etc. Infinitely variable range of speeds and feeds. Any combination of speeds and feed controls can be supplied or eliminated subject to customers requirements.



● **HOLE GRINDING
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Accurately and quickly finishes holes and bores up to 6" diameter in hardened parts. Simplifies handling work too large to swing in standard machines. Special adaptors permit easy installation on any milling machine.

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for details and
specifications



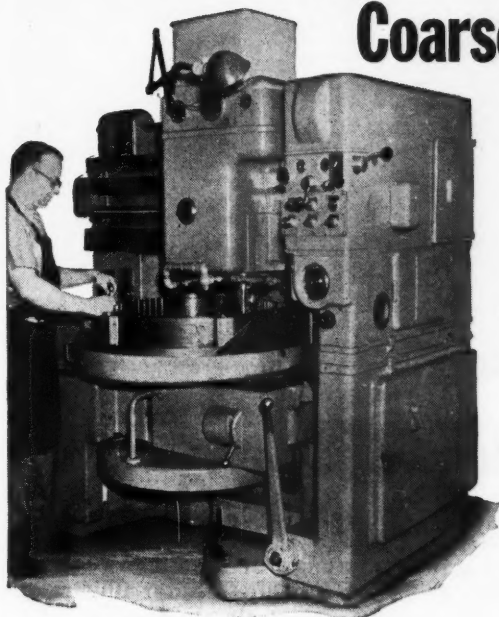
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MACHINERY COMPANY

MORE GOODS for MORE PEOPLE at LOWER COST

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Fellows 36-inch Gear Shaper
installed at Pawling & Harnischfeger

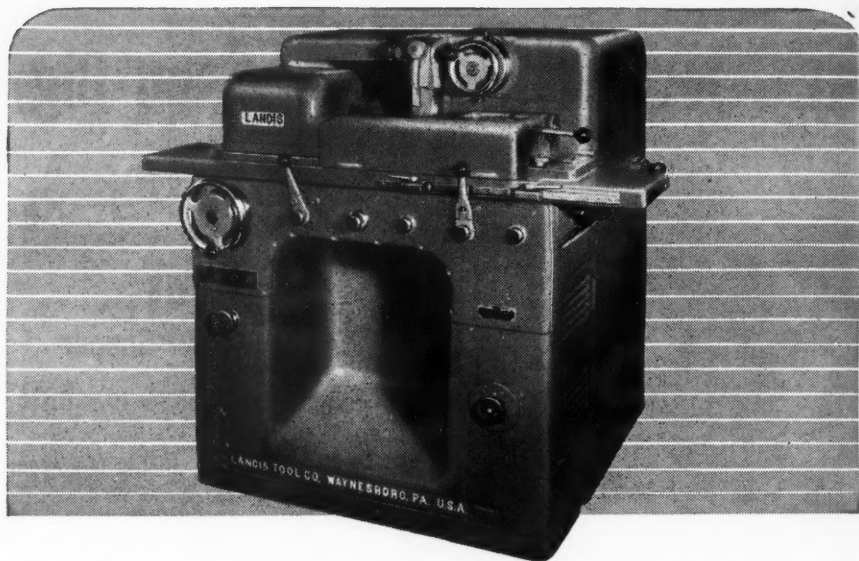
New FELLOWS 36 inch Gear Shaper an All-purpose machine

Time saving is mighty important in either production or jobbing shop gear cutting. The 36-inch Fellows machine is so ruggedly built that it is capable of taking extremely heavy cuts, and at the same time produces a smooth finish with a high degree of accuracy.

This all-purpose machine is adapted to the cutting of external spur and helical gears up to 36 inches pitch diameter, as well as a large variety of non-gear work. Contact our nearest office for full information on this newest of heavy-duty Fellows Gear Shapers.

Fellows

The Fellows Gear Shaper Co., Head Office and Export Dept., Springfield, Vermont. Branch Offices: 616 Fisher Building, Detroit 2; 640 West Town Office Building, Chicago 12; 7706 Empire State Building, New York 1.



For Lowest Precision Grinding Costs get the best.. **LANDIS TOOL**

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For either tool room or production work, Landis Tool precision grinders give you a big increase in performance for very little cost.

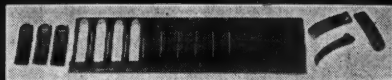
4" Type H Plain Grinder

Lengths between centers available	12" and 18"
Maximum work swing	4 31/32"
Traverse speed	3"-120" per minute
Grinding wheel—standard	16"
Work speeds—r.p.m.	200 to 900
Maximum weight carried on centers	25 lbs.

Help for your grinder operators—Send for free illustrated book "Better Grinding."
World's Largest Manufacturer of Precision Grinders Exclusively.

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Precision Grinders

LANDIS TOOL COMPANY, 16 EAST 6TH ST., WAYNESBORO, PENNA.



120 Pieces
Per Minute

...from
3 1/2" x .018" Brass

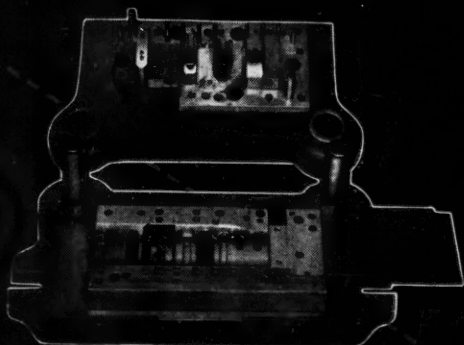


Photo courtesy of Federal Tool Corporation, Chicago

...using **DANLY** Precision Die Set

Save Time...

Use **DANLY** Nation-Wide Die Set Assembly Service

Assembly plants (marked with stars) stock interchangeable parts for quick assembly and delivery of any standard die set to your specifications.

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- * Milwaukee 2, 111 E. Wisconsin Ave.
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Precision Guiding Required on Deep Blanking Tool

Here is another example of how Danly Precision Die Sets help maintain accurate punch and die relationship on high production work. The part illustrated, a slide cover, is produced at a rate of 120 pieces per minute on the 11-station progressive die and a Danly Standard Precision Semi-Steel Die Set.

An unusual deep blanking tool used in the last station requires precision guiding by the Danly Die Set to prevent breakdowns and assure peak performance. The blanking punch at this station enters the die a distance of 5/16".

Sequence of Operations

Brass coil stock, 3 1/2" wide x .018" thick, is automatically fed through the following operations: Pierce pilot hole, slit, first form, idle, draw shape, pilot, restrike shape, pierce, idle, blank, pilot in scrap.

To date, over 3,000,000 pieces have been produced with the same Danly Die Set. An average of 200,000 pieces per grind is obtained.

Helpful Engineering Service — For helpful engineering service on die sets of any size, standard or special, for any type of press operation, consult Danly without obligation.

get this *free* bulletin

Illustrates how Danly special machining and welding facilities help you save time and money on special die set applications.



DANLY

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TO THE STAMPING INDUSTRY

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WOLF PORTABLE ELECTRIC TOOLS

NOTED FOR FINE ENGLISH CRAFTSMANSHIP



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50 WORLD MARKETS
WINNING RECOGNITION
FOR HIGH QUALITY

NOW AVAILABLE—FOR IMMEDIATE DELIVERY

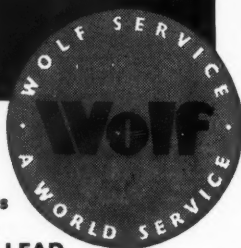
SD4C $\frac{1}{2}$ "

STANDARD DUTY DRILL

FOR

- ▶ PRODUCTION
- ▶ MAINTENANCE
- ▶ CONSTRUCTION

- POWERFUL
- LIGHTWEIGHT
- AIR-COOLED
- UNIVERSAL 110-120 Volts
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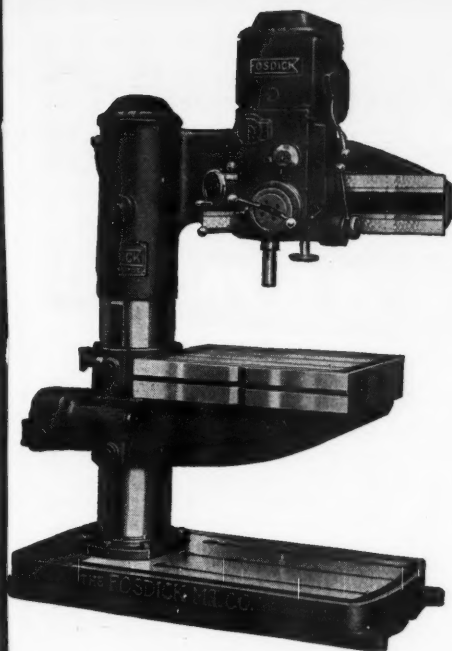
OTHER **Wolf** PRODUCTION TOOLS COMING SOON

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A RADIAL DRILL

*Specifically
designed
for sensitive
drilling*

FOSDICK SENSITIVE RADIAL

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may be swung out of the way for tall jobs mounted on the base.

The head of simple design has nine speeds and four feeds. The nine speeds are controlled by a direct reading lever at the bottom left hand side of the head. The four feeds are operated by a single direct reading lever on the right hand side of the head. The feed clutch and quick return mechanism is of entirely new design.

These are but a few of the many time and cost saving features of this Fosdick Sensitive Radial.



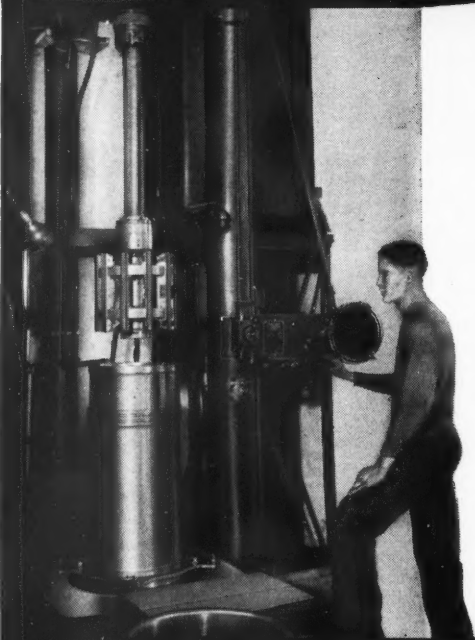
● Complete details of design, construction and operation are available in the Fosdick Sensitive Radial R.S.M.M.S. Write for yours.

FOSDICK

MACHINE TOOL CO.
CINCINNATI 23, OHIO

If your production involves finishing
any type of cylindrical bore ranging
from 1/2" to 30" I.D. . . .

FULMER HONING WILL DO IT FASTER!



Almost any type of internal cylindrical surface is a *boning* possibility. The cylindrical surface can be long or short, open at both ends, closed at one end, containing different diameters, ports, shoulders or interruptions in the surface to be finished.

All of these surfaces can be finished *faster*, and *more economically*, by honing on Fulmer Honing Machines. Large amounts of stock can be removed rapidly, reducing costs of preceding operations. Working tolerances as close as $\pm .0001$ " can be held on bore size, straightness, roundness. Any surface finish from 1 or 2 micro-inches up can be produced. And Fulmer Honing Machines are simple to operate—many users have unskilled labor running them efficiently.

Put Fulmer Honing to work speeding and *improving* your production now. Get full details today.

CHECK THIS FOR FAST PRODUCTION HONING:

At Hunt-Spiller Mfg. Company, a Fulmer Model 15-48 Honing Machine is used to hone 12 1/2" diam., 42" length, Baldwin Gun Iron Diesel Locomotive Cylinders, removing from .012"—.015" of stock in from 10 to 12 minutes per piece.

C. ALLEN FULMER COMPANY

1233 First National Bank Bldg., Cincinnati, Ohio

FULMER

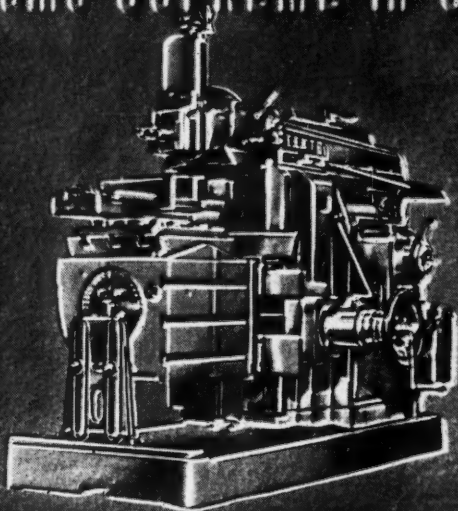
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★ Honing Machines • Rod Borers • Piston Ring Lappers

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GEMCO


...the Name SUPREME in Shapers



Advanced Leadership in Design and Engineering

- ★ FIRST for Precision with Ruggedness...
- ★ FIRST for Adaptability...
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The Shapers with the Exclusive LUBRIGARD

SAFETY  DEVICE

GENERAL ENGINEERING & MFG. CO.

ST. LOUIS 16, MO.

THE LINE ON WHICH TO STANDARDIZE FOR A HIGHER STANDARD OF RESULTS

SAMPLES...



SEND

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The applications for this equipment are in the polishing and assembly department — foundry — forging — tool room — machine shop — sheet metal — deburring, etc.

For small production jobs, we have modern hand equipment — for medium production, Semi-Automatics — for high production, Full Automatic.

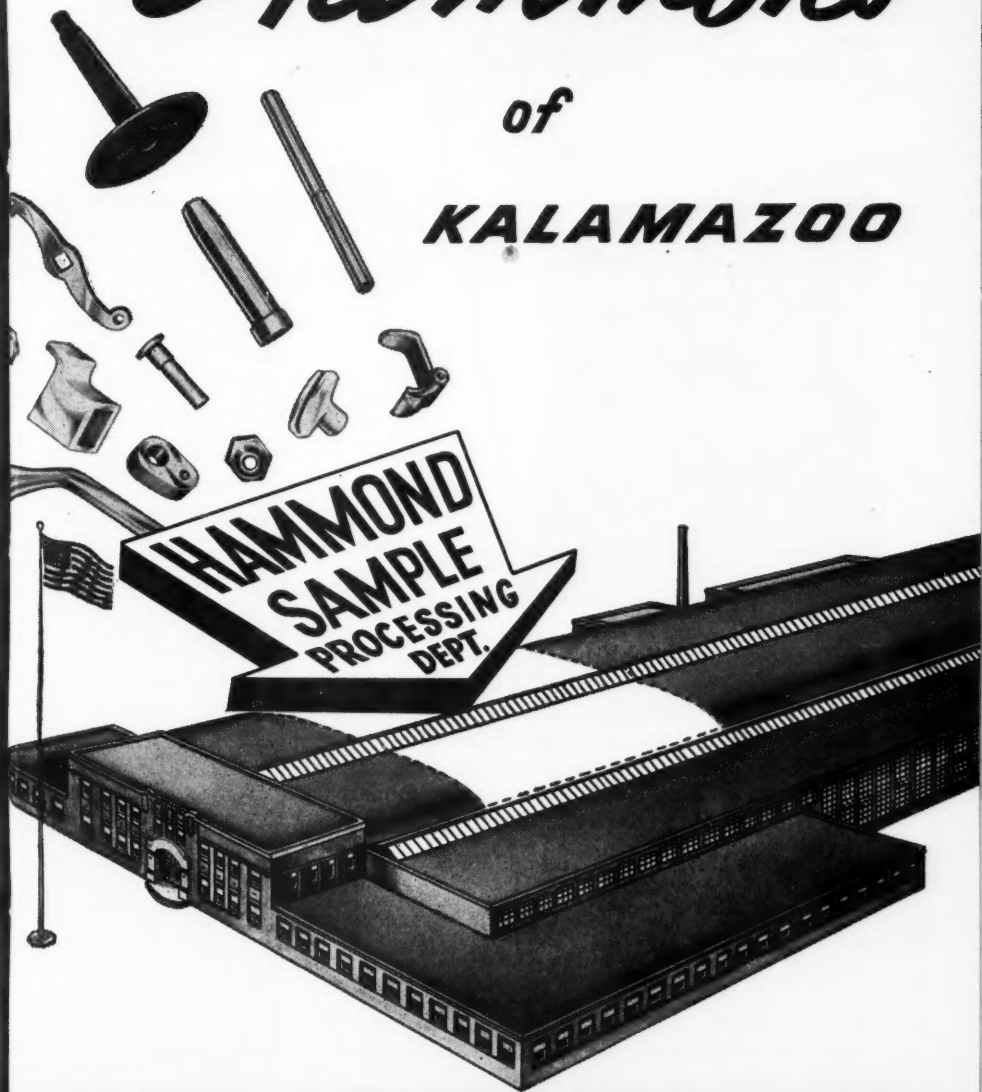
Send one finished and ten rough samples marked for "Hammond Sample Processing Department." Complete engineering report will be promptly sent — there is no obligation.

Hammond Machine Co.

to *Hammond*

of

KALAMAZOO



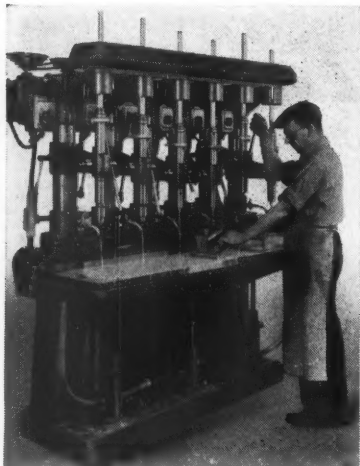
Builders

1615 DOUGLAS AVENUE

KALAMAZOO, MICHIGAN

FOR LOWER MANUFACTURING COSTS

It's "ALL DRILL"
Rugged, Fast, Accurate



Buffalo

No.
16

•
Up to
7/8" Holes
•

Bench
or Floor
Models

Not built just to "look pretty," but to give you **BETTER, LOWER COST DRILLING**, the "Buffalo" No. 16 Drill is rugged and rigid from spindle-tip to base. Quick speed changes from 400 to 3,000 rpm. All adjustments and controls are simple, quick, precise. Single and multi-spindle models to fit your operation. Deliveries are good.

Write for Bulletin 3730!

**BUFFALO FORGE
COMPANY**

388 BROADWAY

BUFFALO, N. Y.

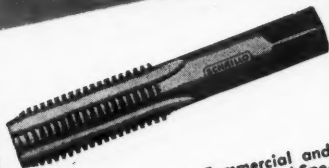
Canadian Blower & Forge Co., Ltd., Kitchener, Ont.



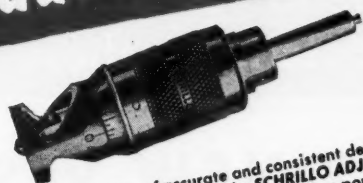
- ★ BACK SPOT
FACERS
- ★ BAR CUTTERS
- ★ BENDING ROLLS
- ★ BILLET SHEARS
- ★ DOUBLE END
PUNCHES AND SHEARS
- ★ LOCOMOTIVE
SHEARS
- ★ MILL TYPE
SHEARS
- ★ RAPID ACTING
PUNCHES
- ★ SINGLE END
SHEARS
- ★ SPRUE CUTTERS
- ★ STRUCTURAL
IRON WORKERS
- ★ UNIVERSAL
IRON WORKERS
- ★ DRILLS FOR THE
PRODUCTION LINE —
DRILLS FOR THE
TOOL ROOM

CONTINUOUS SERVICE — FASTER OPERATION — PEAK ACCURACY

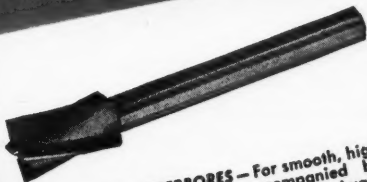
Lower Your Production Costs!



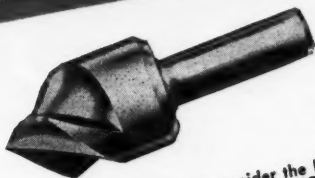
SCHRILLO TAPS—Commercial and Precision Ground—Standard and Special pitches. For more tapped holes per sharpening, insist on **SCHRILLO TAPS**—



For the production of accurate and consistent depths of countersunk holes, specify the **SCHRILLO ADJUSTABLE MICROMETER STOP COUNTERSINK**, a popular priced precision tool. Depth adjustments in increments of .001 of an inch.



SCHRILLO COUNTERBORES—For smooth, high production counterboring accompanied by long life, accuracy and dependability—Available in size range of $\frac{1}{4}$ " to $1\frac{1}{2}$ ".



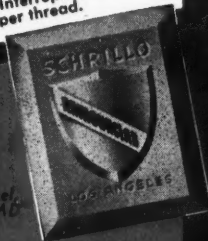
For superior countersinking consider the high shearing action of the **SCHRILLO SPIRAL FLUTED COUNTERSINK**. Available in a size range of $\frac{1}{4}$ " to $1\frac{1}{2}$ ".



SCHRILLO PIPE TAPS—Available in standard sizes and pitches—Interrupted and standard thread—Straight and taper thread.



SCHRILLO COMBINED DRILL AND COUNTERSINKS. A complete range of standard sizes available out of stock.



ATTENTION PLEASE:
for production tapping of heat treated high tensile alloy steel, try our new "ARMOURCLAD" taps, at no additional cost.

Lower production costs are reflected on the profit side of the ledger and are a direct result of Better Tools—Better Equipment—and wide awake supervision. Let us suggest, advise, and supply whenever you are confronted with a tooling problem. A wealth of experience is at your disposal.

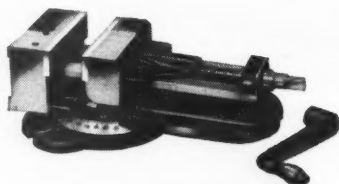
When the occasion demands the finest—and consistently the finest—Specify **SCHRILLO**. Special tools and gages made to your specifications. Consult our local distributor for prompt and courteous service.

SCHRILLO

Aero Tool Engineering Company

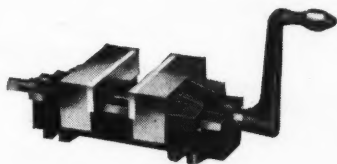
Send for Bulletin No. 44
describing these

2 NEW VISES



SWIVEL-BASE

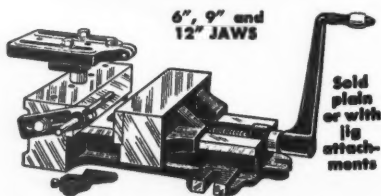
Finely and accurately made. Unique **ADJUSTABLE ZERO POINTER**. Vise removable from base, to use plain. Screw never protrudes under work, cannot be drilled into. Usable with Jig Attachments.



CENTERING

Centers work regardless of size variations, as both jaws move toward center. This gives double-fast action. Handle fits on either end.

MULTI-PURPOSE



The famous Graham Vise that saves so much toolmaking cost by its special attachments. Three sizes to 124 lbs. for shaper, planer, drill press, radial, miller, grinder.

"ADJUST-ANGLE" KNURL HOLDER

**Straight
Knurls
Cut Many
Patterns**

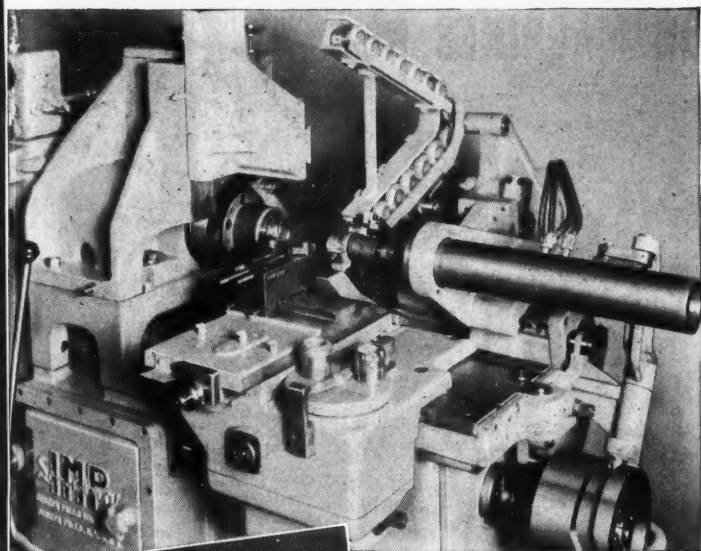


With shank made to fit your turret or tailstock, this Holder knurls work up to 2½" dia. with a variety of patterns using only straight knurls.

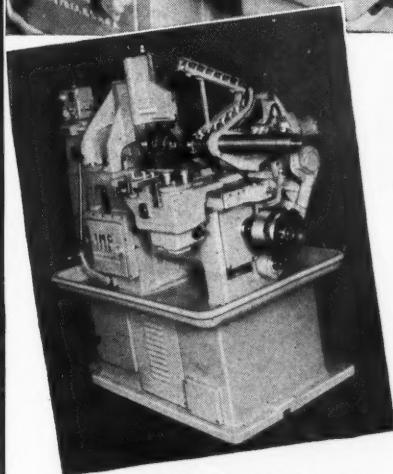
GRAHAM MFG. CO., 38 Bridge St., East Greenwich, R. I.

MACHINE OF THE MONTH

PREPARED BY THE SENECA FALLS MACHINE CO. "THE Lo-swing PEOPLE" SENECA FALLS, NEW YORK



The close-up view of the machine shows the cams (covers removed) which operate the automatic loader and which assure perfect timing of all movements.



Lo-swing Lathes fitted with Automatic Loaders are usually grouped together in series of two or more as one operator can easily keep the loading chutes on several machines filled.

AUTOMATICALLY LOADED *Lo-swing* IMP TURNS BRONZE COUPLINGS AT FAST RATE

Problem: To finish turn spherical end of bronze couplings. Operation consists of turning outside diameter, forming large radius, facing inside shoulder, and chamfering inside diameter.

Solution: The fully-automatic Lo-swing IMP Lathe selected for this job was fitted with a new type loader, designed for handling fairly heavy castings. The machine is entirely automatic. Bronze couplings which have been previously turned and threaded on the small end are placed in the loading chute and fed by gravity into a cradle where they are picked up by the injector head and chucked in an air-operated collet chuck. Turning of the O. D. and chamfering of the I. D. are accomplished with two tools mounted on the front slide, while squaring of the shoulder and forming of the radius are done with two tools mounted on the vertical slide. The finished piece is then automatically ejected and picked up by a safety finger which in turn drops it on the evacuation chute. The cycle is then repeated. A high hourly production is maintained due to the rapid operation of the automatic loader.

SENECA FALLS MACHINE CO., SENECA FALLS, N. Y.

PRODUCTION COSTS ARE LOWER WITH S

MORRIS

MOR-SPEED
PRODUCTION MACHINES

Designed and Built
To Meet
Your Specific Job Needs



The machine illustrated here was designed and built for drilling, reaming, counterboring and spot-facing operations on housings for automobile oil pumps.

This Hydraulic Vertical 6-station Automatic Indexing Drilling Machine is equipped with four vertical drill spindles, two vertical reaming spindles, one vertical counterboring spindle, one vertical spotfacing spindle and three horizontal drill spindles. Six hand clamp holding fixtures enable operator to load and unload machine easily and quickly at each indexing of machine.

If you have a high production problem, consult MORRIS — MORRIS will build the machine to fit your need.



The MORRIS Machine Tool Co.
CINCINNATI 3, OHIO

This Tubular Pitcher

makes a hit

Powered by compressed air, this new invention will throw a baseball faster and more accurately than any human can. It can be adjusted to pitch 8 different curves, and will groove the plate every time, at the exact height desired. Eagerly adopted by major league ball clubs, this mechanical pitcher even takes on batting chores—when set up over home plate, it will lay down a 400 foot fungo in any direction.

The barrel, curve adapter and air chamber of this "iron man" are seamless steel tubes. The barrel bore is required to fit a baseball without seizing, yet tightly enough to prevent loss of compressed air power while firing. Despite this unusual specification, tubing of the required size is regularly supplied—right out of Frasse warehouse stock.

You're invited to be choosy when you work with Frasse tubing stocks. Sizes in mechanical tubing range from a convenient $\frac{3}{32}$ " to $10\frac{1}{2}$ " O.D.—and unusually complete inventories are equally handy in stainless tubing, aircraft tubes and condenser and pressure tubes. What are your requirements? Peter A. FRASSE and Co., Inc., 17 Grand Street, New York 13, N. Y. (Walker 5-2200) • 3911 Wissahickon Avenue, Philadelphia 29, Pa. (Baldwin 9-9900) • 50 Exchange Street, Buffalo 3, N. Y. (Washington 2000) • Jersey City • Syracuse • Hartford • Rochester • Baltimore

FRASSE

for Steel Tubing

Seamless and Welded Mechanical
Pressure and Condenser Tubes
Stainless Tube, Pipe and Fittings
Tubing to Aircraft Specification



The Hardest Possible Metal Sawing

... cutting off test specimens in the Metallurgical Laboratory of this giant steel plant. There is no time for pampering here. Each saw must handle anything that comes, as it comes—the hardest steels and toughest alloys, in all degrees of hardness—in any size, any form or condition—because each heat, each drawing, and each forming run has to be tested.

The steel mill where these pictures were taken reports that these saws have been operating 24 hours, 7 days a week for the last five years. Maintenance cost has been practically non-existent. Furthermore, the efficiency of these saws has made possible the elimination

of an equal number of other sawing machines in the department.

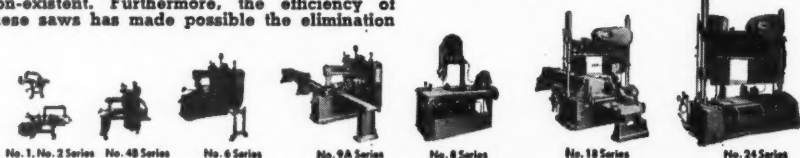
The answer to your cut-off problem, whether large or small, will be found in our new C48 catalog. The services of our field engineers are also available in every locality. Send for either or both now.

ARMSTRONG-BLUM MFG. CO.

"The Hack Saw People"

5700 Bloomingdale Ave.

Chicago 39, U.S.A.



No. 1, No. 2 Series

No. 4B Series

No. 6 Series

No. 9A Series

No. 8 Series

No. 18 Series

No. 24 Series

MARVEL *Metal Cutting*
SAWS
Better Machines—Better Blades

Avey's PRESCRIPTION FOR...

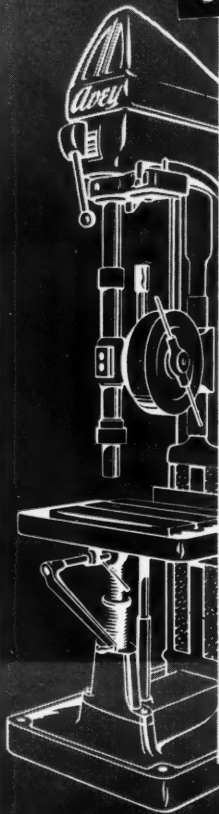
PRODUCTION!

Rx

Fill out this form for Avey's **FREE**
Engineering Estimate of your production problems!

INFORMATION FOR ESTIMATES

1. MATERIAL—HARDNESS
2. CASTING OR FORGING DRAWING
PREFERRED WITH WORK MARKED
3. PRODUCTION REQUIRED
PER HOUR . . . OR PER WEEK
4. PREFERRED METHOD
5. LOCATING POINTS
6. OPERATION DRILL—TAP—
END MILL—HOLLOW MILL
7. VOLTAGE
8. HOW IS JOB BEING DONE NOW
STANDARD . . . SPECIAL?
9. SUBMIT PROPOSAL TO



If something's wrong with you, you have your doctor prescribe a cure. If a difficult shallow or deep hole drilling or tapping problem is cutting down your plant's production or efficiency, let Avey Engineering prescribe the cure! No obligation! Mail this today!

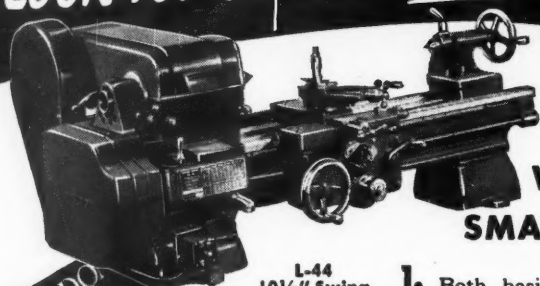


CINCINNATI, OHIO

Avey

DRILLING MACHINES

Look for these new Features.



L-44
10 1/8" Swing
Lathe



Sheldon
TRB5-56
11 1/4" Swing
Lathe



Sheldon
TU-1248P
13 1/8" Swing
Lathe



WHEN BUYING SMALL LATHES

1. Both basic (a) and operating (b) accuracy of the bed—(a) Ways held to tolerances of .005" per foot horizontal and parallel alignment. (b) Engineered distribution of mass to give extreme rigidity without excessive bulk.

2. Timken Precision Taper Roller Bearings—for regular operating speed and permanent accuracy.

3. Increased Collet Capacity.

4. Greater Swing for size.

5. Greater Power at tool point.

6. V-Belt Motor Drive with increased speed range.

7. Lower prices—far more tool for the money resulting from modern manufacturing methods, in a specially built plant that is "tooled to the teeth" with the finest machine tool building equipment.

Write for the New G-48 Catalogue of Sheldon Lathes and check each for these 7 important features.

SHELDON MACHINE CO. Inc.
Made in U.S.A. of the finest materials. Precision Engineering. Chicago, Ill. U.S.A.
 1331 N. ANGELO AVENUE • CHICAGO 41, ILLINOIS, U.S.A.



Photo courtesy The Astatic Corporation, Connaut, Ohio

Checking a phonograph precious metal needle cartridge for stylus projection, tip radius and included angle on a Jones & Lamson 14" Pedestal Optical Comparator.

*"The only
Satisfactory
way"*

"We find this the only satisfactory way to check such small parts, as the tip radii range from .0028" to .003". In addition other important dimensions can readily be checked."

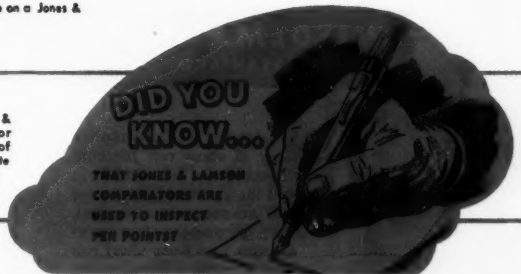
Says The Astatic Corporation, manufacturer of sound reproducing equipment, who use Jones & Lamson Comparators to help maintain the highest standards of operating efficiency for its products.

Many components and products formerly inspected by slow, tedious methods, that retarded production and drained profits, are now inspected in seconds or minutes on Jones & Lamson Comparators, by operators with only a minimum of instruction. Savings are made all along the line, in gage cost, in time and in overhead.

Our engineers are inspection specialists; their knowledge of holding fixtures, handling methods and suitable Comparator equipment has saved hundreds of thousands of dollars throughout the country. Call, write or wire for their services today.



Every owner of a Jones & Lamson Optical Comparator should have this catalog of standard glass screens. Write to Dept. 710 for your copy.



Optical Comparator Division

JONES & LAMSON

MACHINE COMPANY
Springfield, Vermont, U.S.A.

MACHINE TOOL CRAFTSMEN SINCE 1835

has
your shop got
the
**"TOOL ROOM
TROTS?"**

How much time is wasted "on the road" while punch press operators and set-up men go back and forth to the tool room to get punches and dies for a short run set-up?

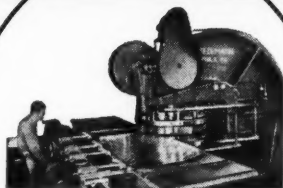
SEE A WIEDEMANN

With a Wiedemann Turret Punch Press, the operator remains at the machine . . . no need to make numerous time consuming "trips," since 11 to 32 punches and dies are carried in the turret . . . ready for instant piercing . . . always at the operator's fingertips. In addition, a Wiedemann saves you hours of layout time. On some machines, layout time is completely eliminated because of material handling gauge tables that position the material ready for piercing by obtaining the X and Y coordinate from blueprints or charts.

WIEDEMANN MACHINE COMPANY

4219 WISSAHICKON AVENUE • PHILADELPHIA 32, PA.

Send today for the complete story of short run piercing economy . . . Bulletin 92 . . . and then if you'd like to see a Wiedemann in operation, we'll tell you the shop nearest you that does short run piercing with a Wiedemann.



This Type R-7 Turret Punch Press cut production time from over 12 hours to 73 minutes on short run jobs. Get the proof!

No cam worries with a Warner & Swasey 5-Spindle Automatic



**NO CAMS
TO DESIGN**



**NO CAMS
TO MACHINE**



**NO CAMS
TO STORE**



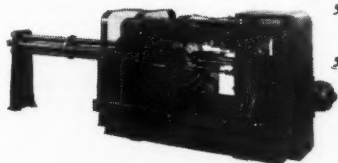
**NO CAMS
TO FIND**



**NO CAMS
TO CHANGE**

JUST make a simple setting and there you have your new feed stroke, clearly indicated on a graduated scale. Yes, it's as easy as that! All feed strokes are quickly available for both longitudinal and cross slides. No more need to sacrifice cycle time because the "right" cam is not on hand or because a cam change would take too long. You always get your exact feed stroke quickly on the Warner & Swasey 5-Spindle Automatic.

Full information on these new machine tools will show you how their many new features and design improvements can cut costs, boost production in your shop. Ask your nearest Warner & Swasey office for full particulars or write to Warner & Swasey, Cleveland 3, Ohio.



3-Spindle Bar Machines
—1½" Standard Capacity
—2¼" Oversize Capacity
3-Spindle Chucking Machine—6" Swing

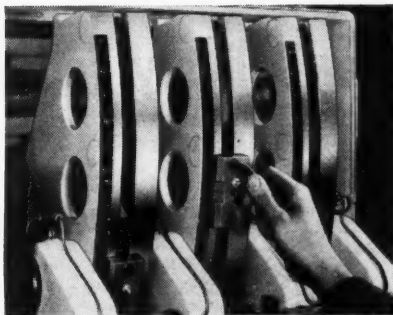


IT'S SIMPLE TO SET UP

**WARNER
&
SWASEY**
Machine Tools
Cleveland

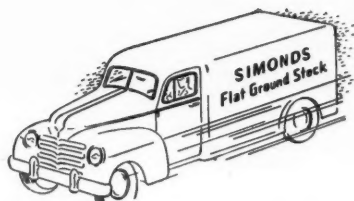
You Can Machine it Better, Faster, for Less... with a Warner & Swasey

TURRET LATHES, MULTIPLE & SINGLE SPINDLE AUTOMATICS, PRECISION TAPPING AND THREADING MACHINES



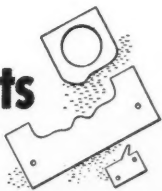
Patented "Quick Set" quadrants cut set-up time, quickly adjust to any feed stroke between 0 and 5 inches.

Get Delivery Today...



Save Time and Money...

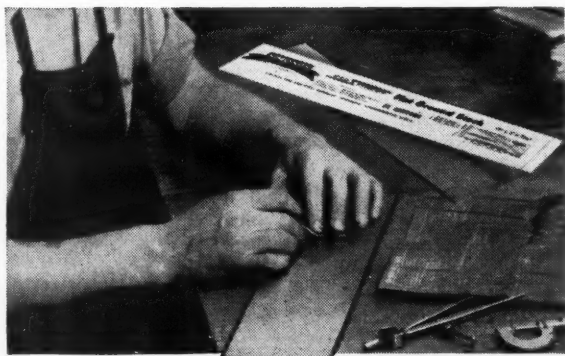
Make your own Dies, Jigs and Parts



HERE'S A COST-CUTTING *NATURAL* that you can cash in on *without any delay*. Get Simonds "Red Streak" Oil Hardening Flat Ground Stock from your Industrial Supply Distributor. He has it in all standard sizes... uniformly annealed for easy machining and proper hardening (with directions on the individual envelope)... cut to 18" length... accurately ground to standard thicknesses and widths... with square edges... and with smooth surfaces for accurate layout work.

No grinding to size. Just cut it... with Simonds Metal-Cutting Band Saws... to your own designs of punches, dies, gages, jigs, fixtures, templates, stamps, shims, small machine parts, and other items which you now have to order and wait for. Call your Distributor *today*.

BRANCH OFFICES: 1550 Columbia Road, Boston 27, Mass.; 127 S. Green St., Chicago 7, Ill.; 416 West Eighth St., Los Angeles 14, Calif.; 228 First St., San Francisco 5, Calif.; 511 S. W. First Ave., Portland 4, Ore.; 31 W. Trent Ave., Spokane 9, Washington. Canadian Factory: 595 St. Remi St., Montreal 30, Que.



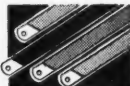
SIMONDS ALSO MAKES



Circular Metal-Cutting Saws
(Solid-Tooth, Inserted Tooth,
Segmental)



Metal-Cutting Band Saws



"Red Eye" Rockers



"Red Tung" Files

PLUS A WIDE LINE OF TOOLS FOR CUTTING WOOD, PAPER, PLASTICS



SIMONDS "RED STREAK" Oil Hardening FLAT GROUND STOCK



"When you use Simonds you stay in the Highlands... of consistent cutting efficiency"

Reaming

accurate, straight, round holes

With
BARBER-COLMAN
CARBIDE TIPPED
REAMERS

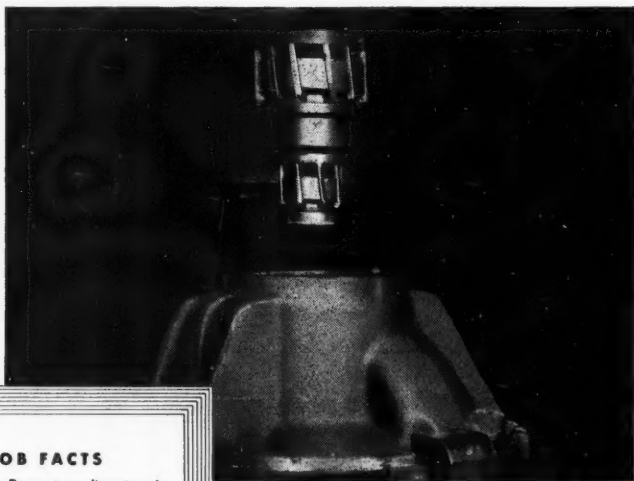
Sand pockets in these motor truck differential housings caused early dulling of high-speed steel reamers and unsatisfactory finish on the reamed surfaces. Barber-Colman Carbide-Tipped Inserted Blade Reamers were tried, and tool life jumped from 150 to 3000 pieces per sharpening.

These reamers are designed with irregular blade spacing, and special cutting and relief clearances to provide smooth cutting action. Two holes are reamed straight and round, in alignment. Diameters are held within .001". The ability of the carbide to resist wear in this abrasive material greatly improves the finish, and the irregularly spaced blade design has eliminated the tendency of the reamer to pattern and form wells.

Consult Barber-Colman Reamer Engineers for application of Carbide-Tipped tools to your reaming problems.

Barber-Colman Company

GENERAL OFFICES AND PLANT 179 LOOMIS ST., ROCKFORD, ILLINOIS, U.S.A.



JOB FACTS

- Operation — Ream two diameters in alignment
- Material — Malleable Iron Casting
- Tool Life — 3000-4000 castings per sharpening
- Tolerance — Diameters finished within .001"



lightweight champ



The new Traytop line of light duty geared head engine lathes (10", 12½", 15", and 18" swing sizes) offers many "high price" lathe features at truly low cost: 12 spindle speeds, selected by color-coded dial, 48 thread and feed changes, exceptionally large spindles, anti-friction bearings, double-walled apron, totally enclosed gear box, many others. Distance between centers from 18" to 60". 15" and 18" sizes can be furnished with gap and gap block. Write for Bulletin T-100.



cintilathe

CINCINNATI LATHE & TOOL CO.

CINCINNATI 9, OHIO

NEW!

The Art

OF

BLANCHARD SURFACE GRINDING

SEND FOR YOUR FREE COPY



MATERIAL: Soft, low Carbon Steel, Steel Castings, Malleable Iron, Steel Forgings, Soft Alloy Steel.

PLATE	PICTURE	DETAIL	WHEEL	GRINDING SPEED	WHEEL SPEED	WHEEL
Plate 12		1/4" Cold Flat	No. 18-36" 1-49 sq. in.	33 RPM .024"	24980 (1)	
		1/4" Commercial ±.002"	No. 11-16" 72 sq. in.	24 RPM .022"	24940	
		1/4" A Side Commercial ±.000" ±.005"	No. 16-30" 132 sq. in.	20 RPM .020"	24950	
Plate 14		1/4" Commercial ±.003"	No. 18-36" 104 sq. in.	18 RPM .018"	24950	
		1/4" A Side Commercial ±.002"	No. 18-36" 378 sq. in.	33 RPM .012"	24950	
Plate 15		.030" Water-tight Steel Flat .0003"	No. 27-40" 2130 sq. in.	5 RPM .004"	24990 (2)	

(1) A 24980 wheel normally for use for this curve surface. A water wheel can used to reduce over-heating time.
 (2) This illustration is representative. Commercial, 24-30 inch wheel; Steel, 13-36 inch wheel; Flat, 216-12 inch wheel.

This new Booklet, "The Art of Blanchard Surface Grinding," will assist you in answering such questions as:

1. What wheel to use
2. How to chuck and hold work
3. How to get fine finishes
4. Grinding for flatness
5. Correct feed and table speed
6. How to grind spherical surfaces
7. How to get maximum production
8. How to figure grinding costs

COUPON

Without obligation, please send me the new booklet, "The Art of Blanchard Surface Grinding."

NAME.....TITLE.....

COMPANY.....

CITY.....STATE.....



The BLANCHARD MACHINE COMPANY

64 STATE STREET, CAMBRIDGE 39, MASS., U. S. A.

A NEW GEM in



INDEPENDENT PNEUMATIC TOOL COMPANY

Aurora, Illinois

Export Division: 330 West 42nd Street, New York 18, N. Y.

Birmingham	Boston	Buffalo	Chicago	Cincinnati	Cleveland	Denver
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Pittsburgh	St. Louis	St. Paul	Salt Lake City			
San Francisco	Toronto, Canada	Sao Paulo, Brazil	London, England			

the Thor Silver Line

A new symbol of distinction in high quality, high lustre portable electric tools—by Thor.

PACKAGE OF STALL-PROOF POWER!

*... the smallest, lightest, most
POWERFUL ½-inch portable
electric drill in the world—a
statement no other manufacturer
can make!*

Thor PORTABLE POWER
TOOLS

PNEUMATIC TOOLS • UNIVERSAL AND HIGH FREQUENCY ELECTRIC TOOLS • MINING AND CONTRACTORS TOOLS



**Why Carry
the Motor...
When you need
only hold the Tool!**

**MALL 3 H.P.
GEARED HEAD
GRINDING UNIT**

Mall
REG. U.S. PAT. OFF.

**FLEXIBLE SHAFT
GRINDER**

With the motor mounted on an easy-rolling pedestal or overhead trolley, a Mall Flexible Shaft Grinder—equipped with lightweight working tools—enables you to finish larger areas faster, easier, cheaper with less fatigue. Because the motor is not carried, more copper and iron is used to protect against burnouts on overloads, more power is developed, and the motor is sealed against dust, grit, steel particles, dirt, grease and vapor. The lightweight working tools are more comfortable to hold than heavy self-contained tools, and the attachments for grinding, sanding, buffing and polishing can be interchanged by simply pressing a button. 3 H.P. Geared Head, $\frac{3}{4}$, 1, $1\frac{1}{2}$ H.P. Direct Drive and $\frac{3}{4}$ H.P. Countershaft models are available.

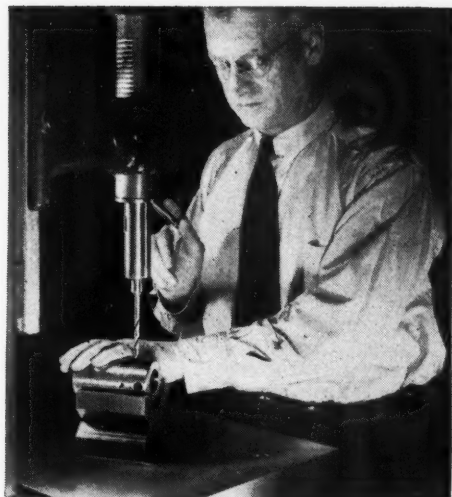
Ask Your Supplier to demonstrate a Mall Flexible Shaft Grinder in your shop TODAY and write for FREE booklet "Mall Grinders."

MALL TOOL COMPANY

7814 South Chicago Avenue

Chicago 19, Illinois

Preferred by Master Craftsmen



**FOR TOOL ROOM
OR
PRODUCTION LINE**

Built carefully to provide the required accuracy for fine tool room work Footburt sensitives are designed with the weight and stability to maintain close tolerances on day after day production work. The correct speed for a wide range of drilling, reaming, and counter-boring operations is instantly available. Write for full information on this great line of sensitive drilling machines.

THE FOOTE-BURT COMPANY
CLEVELAND 8, OHIO

Detroit Office: General Motors Building



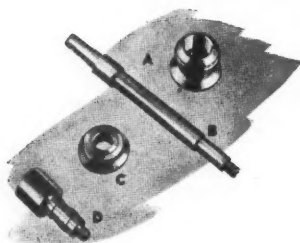
FOOTBURT

Sensitive
DRILLING MACHINES

HARLEY-DAVIDSON MODERNIZES ITS SHOP WITH . . .



GREENLEE SIX-SPINDLE AUTOMATICS



SAMPLES OF MEDIUM AND SHORT-RUN WORK AT HARLEY-DAVIDSON . . .

(A) Upper Head Cone Seat, C1118 stock, run on a 2" Greenlee in lots of 6000. (B) Armature Shaft, C1137 stock requiring 7½" feedout; made 400% faster on Greenlee than by previous method. (C) Starter Clutch, NE8617 stock, run on a 2" Greenlee in lots of 5000. (D) Rear Wheel Brake Operating Shaft, NE8617 stock, run on a 1½" Greenlee in lots of 7000 with a time of approximately 20 seconds per piece.

Ed Rathack, screw machine foreman at Harley-Davidson Motor Co. of Milwaukee for 20 years, says: "I've been on screw machines for forty years. We got our first Greenlees just before the war and now have 16 of them. They have proved out very well. Set-ups can be made quickly and it is easy to duplicate previous experience. We have a lot of short and medium-run jobs of 800 to 10,000 pieces and set-up efficiency is a big help when you are trying to keep costs down on work of this kind. Standardized tooling helps, too. We appreciate the low investment in interchangeable cross-slide cams, and we like the quick setting on the main tool slide. For our kind of work, the Greenlees are good machines." (Mr Rathack is the man with the galluses at the first machine—a 2" Greenlee Six—in the picture above. Harley-Davidson Motor Co. manufactures a widely-known line of Motorcycles, Servi-Cars, and Package Trucks.)



GREENLEE BROS. & CO.

1890 MASON AVENUE, ROCKFORD, ILLINOIS

WRITE FOR MORE FACTS

Send for this 20-page book describing the Greenlee timesaving and cost-saving features.

SEE MOVIE

Ask to see our 40-min. sound movie showing all details of building a Greenlee "G"



MULTIPLE-SPINDLE DRILLING, BORING, TAPPING MACHINES • AUTOMATIC SCREW MACHINES • AUTOMATIC TRANSFER PROCESSING MACHINES



RIGHT DRILLS CUT COSTS 50%

THIS manufacturer of road building equipment drills hundreds of $\frac{3}{8}$ " holes in a cab frame, using universal electric drills with a load speed of about 2000 R.P.M. Drilling was slow because of bulk of the tool.

The Rotor Application Engineer suggested a light-weight, 4000 R.P.M. Rotor Air Drill. Results:

Easy handling. Tool weighs only 1 lb.-10 oz.

—is easy to maneuver. Side-to-center distance of tool is only $\frac{1}{8}$ "—makes it easy to get at hole locations.

Twice as fast. Higher speed under load gets out more work. On this job, it cuts drilling cost in half.

There's no obligation for a study of *your* operations to make similar improvements.

AIR O'TOOL



THE **ROTOR TOOL** CO.

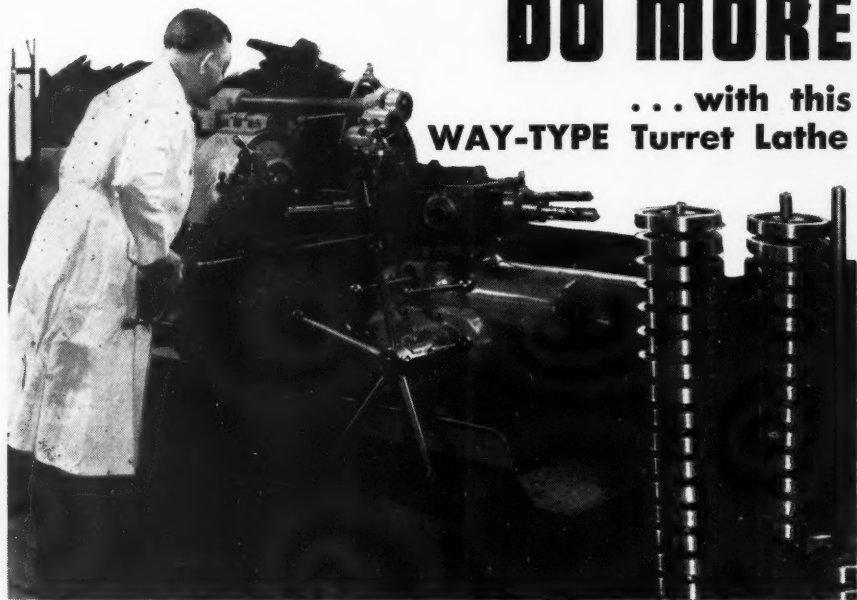
CLEVELAND, OHIO



GET MORE...

DO MORE

... with this
WAY-TYPE Turret Lathe



THE Lodge & Shipley Acme Way-type combines the advantages of conventional Ram-type and Saddle-type lathes. This lathe is especially designed for jobs requiring the normal capacity of the Ram-type lathe and yet needing the additional turret support offered in Saddle-type lathes. It costs less, needs less floor space, uses less expensive tooling than the Saddle-type lathe... yet it operates with the ease and facility of the Ram-type lathe.

An additional feature of this lathe permits the turret to travel 20 inches compared to only 14 inches on the Ram-type. Rigidity is greater than the Ram-type because the turret is always supported on the bedways. For long hole boring this additional support offers greater accuracy not possible with the Ram-type.

Write for Booklet 667 giving full information on the Lodge & Shipley Acme Way-type Lathe.

THE **Lodge & Shipley** COMPANY

CINCINNATI 25, OHIO

MACHINE TOOL DIVISION • 3055 COLERAIN

SPECIAL PRODUCTS DIVISION • 800 EVANS ST.

*High Production on Many
Sizes and Materials - with*



GARDNER Double GRINDERS

THE versatile machine shown above is equipped with a feed-thru type fixture which will handle large-volume production, on many sizes of parts, and many kinds of materials. For example, several sizes of hard rubber washers are loaded into an inclined trough, from which a V-belt feeder carries them through the machine in a continuous stream. Opposed abrasive wheels grind TWO parallel sides with ONE pass. Our engineers will be glad to explain how a GARDNER Double GRINDER will give you high production on a wide range of sizes of hard-to-handle parts, and in many different materials — while grinding within close tolerances, and at high rates of production.

Write us about your parallel-surfacing needs—or send for our DOUBLE Grinder Bulletin.

GARDNER - GRIND
YOUR Flat SURFACES

GARDNER MACHINE COMPANY

428 East Gardner Street • • • • • Beloit, Wisconsin, U.S.A.

WORK DATA

Part Washers
Material Hard Rubber
Operation Grind Two Sides
Tolerances
 .001" to .002" Parallel;
 .003" Uniformity
Stock Removal
 .030" Maximum Overall
Production 25 to 30
 Pieces Per Minute
Feed Semi-Automatic
 "Feed-Thru" Fixture
Machine No. 115-18"
 Gardner Double Grinder

Use Modern
GARDNER
WIRE-LOK
Abrasives
on YOUR
Disc Grinders!



More **POWER** to your *Blades*

Only
M & M builds
ALL 3:
CIRCULAR SAW
SAW BLADE
BLADE GRINDER

**Motch & Merryweather
Triple-Chip SLITTING SAW
and DUAL DRIVE ADAPTORS**
insure more profitable
slotting production.



NOTICE
ALTERNATE
SINGLE AND
DOUBLE CHIPS

- **MORE POWER**
- **HIGHER PRODUCTION**
- **LOWER COSTS**
- **LESS BREAKAGE**

Motch & Merryweather Slitting Saws have an exclusive dual drive feature through which balanced power is transmitted, eliminating

the stresses which cause breakage. A broad, flat hub affords plenty of surface contact for rigid holding, which balks tooth weaving tendencies. Accurate slotting results. Our exclusive Triple-Chip tooth form breaks up and distributes the cutting load, permitting heavier feeds. Deep gullets increase blade strength and produce curling, self-ejecting chips (no clogging). You need fewer blades, since M. & M.'s exclusive adaptors fit many arbor sizes. Three standard tooth spacings in every diameter and thickness aid the cutting of thick or thin sections.



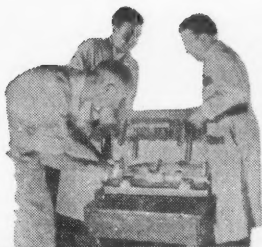
M. & M.'s exclusive dual drive delivers more power to the blade without danger to the driving means. Ample side clearance is ground into the blade down to the broad hub. Standard dual drive adaptors are designed with ample keyway to more than satisfy tough cutting requirements.

Write for our Bulletin "D-10"

SEE OUR EXHIBIT AT A. S. M. EXPOSITION, PHILADELPHIA, OCTOBER 25-29

THE MOTCH & MERRYWEATHER MACHINERY CO.
PENTON BUILDING CLEVELAND 13, OHIO





Hand methods are slow and costly.

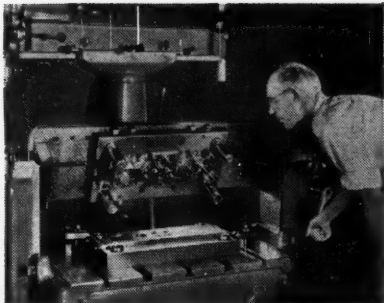
Die assembling now mechanized

Is your toolroom still in the grunt-and-groan era of trying out and assembling large dies? Then it's time you investigated the revolutionary new Moore Die Flipper.

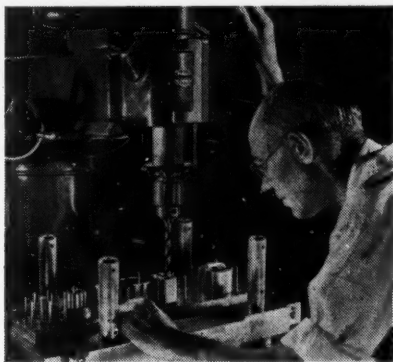
Without physical effort one diemaker can perform all the operations of die-assembling: Take apart, turn over, drill, tap and try out. The Die Flipper will be a money-saver in your toolroom from the start, for it can also be kept busy as a radial drill.

An eight-page catalog, with over 20 photographs and drawings, is just off the press. It's yours for the asking.

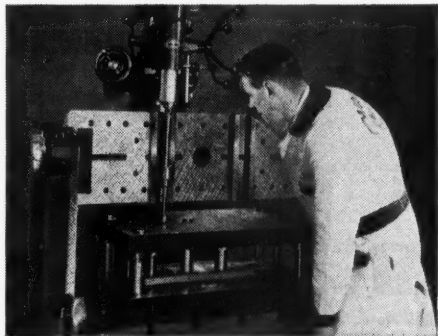
MOORE SPECIAL TOOL COMPANY, INC.
730 UNION AVENUE, BRIDGEPORT 7, CONNECTICUT



With the Moore Die Flipper 1 man does the work of 3.

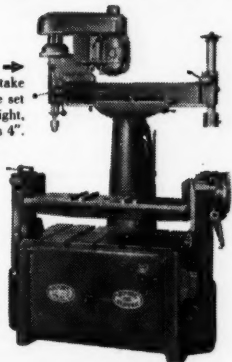


Drilling punch in place. Spring holes are also drilled. Radial drill has 1½" capacity. Tapping is done in same set-up with Lassy Tap Set.



Moore Die Flipper stands 5'x6'x7½" high. It will take apart and flip over a die set 20"x40" with 12" shut height, pins engaged in bushings 4".

← Counterboring for heads of screws tapped into punch flange, showing the use of ¾" chuck with long shank.



ADD TO YOUR TOOLROOM

JIG BORERS

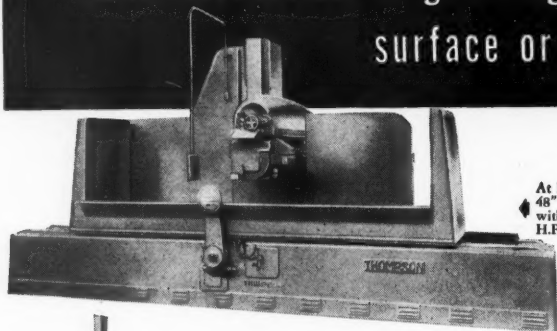
JIG GRINDERS

DIE FLIPPERS

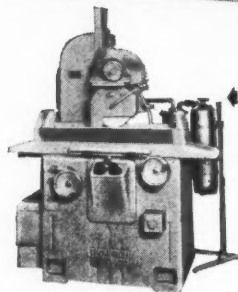
PANTO-CRUSH WHEEL DRESSERS

HOLE LOCATION ACCESSORIES

Investigate the complete line of Thompson Machines **FOR SAVINGS** in grinding every flat surface or contour

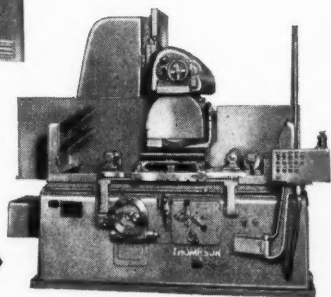


At left—Thompson Heavy Duty Type CX 36" x 48" x 120" Hydraulic Surface Grinder. Equipped with super precision spindle powered with 40 H.P. motor.

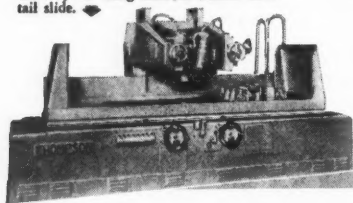


At left—Thompson Type "F" 6" x 10" x 18" Hydraulic Surface Grinder. This machine is arranged to utilize a new principle of applying coolant to the grinding wheel. All of the coolant is applied through the grinding wheel making it possible to grind exceedingly thin sections without burning or warping the work.

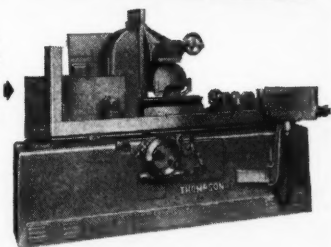
At right—Thompson Type "C" 16" x 16" x 36" Truforming Grinder. The latest design of a Truforming (Crushed Wheel Grinding) machine arranged with Thread Roll Die Grinding Fixture equipped with 20" dia. x 6" face wheel driven by 30 H.P. motor.



Below—Thompson 12" x 11" x 48" Dovetail Way Grinder, designed to eliminate the expensive job of hand scraping machine tool dovetail way bearings. The machine illustrated has capacity for a 12" wide by 48" long male or female dovetail slide.



At right—Thompson Type "B" 12" x 11" x 36" Truforming Grinder. A new design of a popular Truforming (Crushed Wheel Grinding) machine arranged for production grinding of intricate contours.



See Our New
32 Page Catalog
in Sweets—Or
Write for Copy

Thompson
SURFACE
Grinders

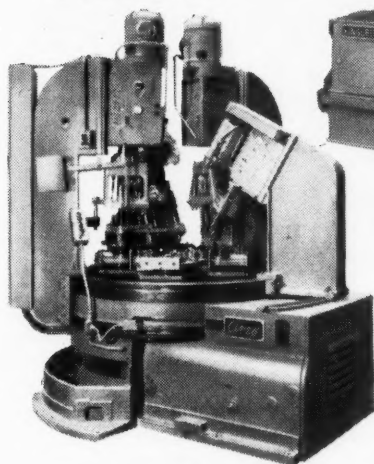
The Thompson Grinder Co., Springfield, Ohio

Leading Drilling Machine Builders

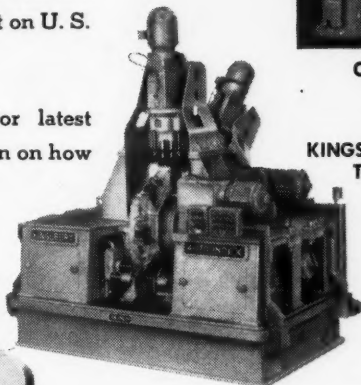
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U. S. DRILL HEADS

IT'S Performance Data that counts.
That's why engineers insist on U. S.
Drill Heads.

Write—or wire—today for latest
catalog and full information on how
we can help you.

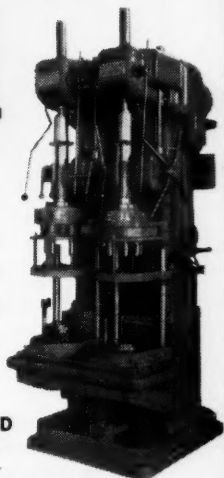


AVEY DRILLING MACHINE CO.

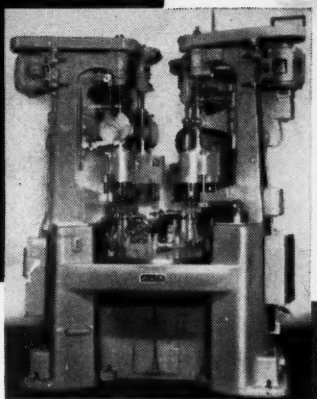


WE manufacture all types
of multiple spindle, fixed
center, adjustable and
lead screw tapping heads.

CINCINNATI BICKFORD
MACHINE TOOL CO.

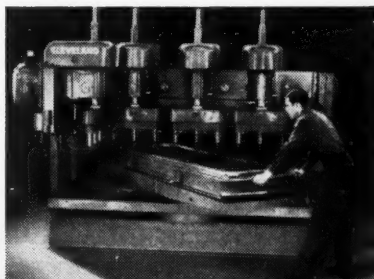


KINGSBURY MACHINE
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CHAS. G. ALLEN CO.

CLEVELAND TAPPING
MACHINE CO.



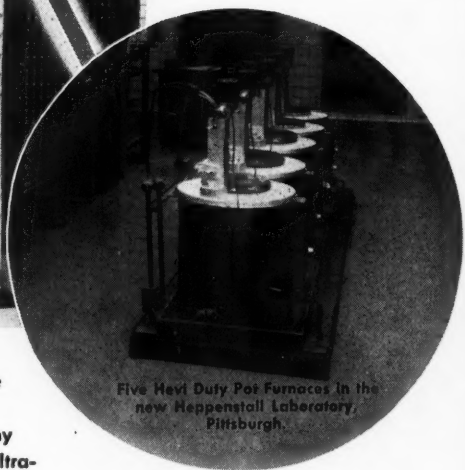
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UNITED STATES DRILL HEAD CO.

CINCINNATI, OHIO



HEVI DUTY FURNACES and HEPPENSTALL RESEARCH



Five Hevi Duty Pot Furnaces in the
new Heppenstall Laboratory,
Pittsburgh.

In their interesting new brochure
"Forging Ahead With Steel Through
Research" the Heppenstall Company
say in describing their new ultra-
modern metallurgical laboratory

" - - superior research would be stimulated by superior equipment - - ".

Five Hevi Duty Pot Furnaces for constant temperature treatment of test
samples are included in the heat treating equipment of this new laboratory.

Many manufacturers have standardized on Hevi Duty Furnaces of
many types not only for production, but for pilot plant and other
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Pot Furnace details are in Bulletin HD-635 and HD-546. Send for them — today.

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HEAT TREATING FURNACES **HEVI DUTY** ELECTRIC EXCLUSIVELY

DRY TYPE TRANSFORMERS — CONSTANT CURRENT REGULATORS

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say...**

"USE SKIL Drills"

Ask about SKIL Drills anywhere in Industry! The answers you get will all add up to this:
Don't just drill it . . . SKIL Drill it!

Ask workers, and you'll hear about better balance, easier handling, faster production. Ask engineers, and you'll hear about extra power, less weight, better design and construction. Ask purchasing departments, and you'll hear about longer service, finer features and lower costs.

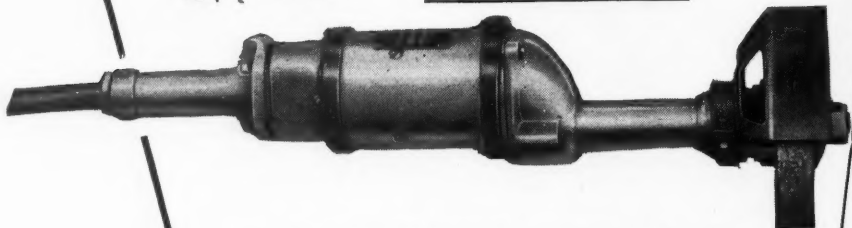
Then grab that phone and ask your SKIL Tool Distributor to demonstrate SKIL Drills today. 26 Powerful models.

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SKIL ELECTRIC
Tools
PNEUMATIC



**Remove more metal
at less cost**



with CP Super Cycle Grinders

Latest CP development in electric tools — the CP Super Cycle — has lowest ratio of weight to horsepower ever built into a portable tool.

CP Super Cycle Grinders are easier to handle, can be located on work more quickly, and are less tiring to hold. Speed does not sag when operator bears down, as tool works at full speed under all loads.

The 360-cycle, 3-phase, 220 volt current motor is of squirrel cage induction type. Maintenance is remarkably low, since there are no brushes to replace nor armatures to burn out.

The complete line of Super Cycle tools includes grinders, sanders, polishers, buffers, screw drivers, drills, nut runners, tappers, in a wide range of speeds.

Write for full information.



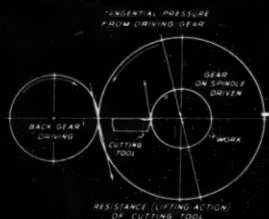
**CHICAGO PNEUMATIC
TOOL COMPANY**

General Offices: 8 East 44th Street, New York 17, N. Y.

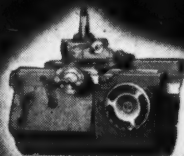
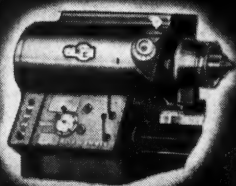
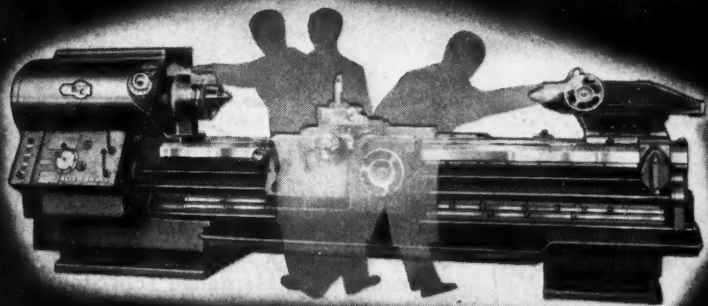
Electric Tools • Air Compressors • Pneumatic Tools • Diesel Engines
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**MOST QUIET, VISIBLE, ACCESSIBLE
25 INCH LATHE EVER DESIGNED
16 SPEEDS 7-500, AND 64 FEEDS**



The down pressure of the back gear at the front (see diagram) counteracts the upward lift of the tool, eliminating chatter inherent in lathes which have a double lift on the spindle — by the tool on one side and back gear on the opposite side.



Imagine! Speed and feed dials can be read by operator or foreman standing 15 feet to the left. Speed and feed tables are read without squat, squint, or stoop, and controls are more accessible because gear box has been sloped.

Sloped apron makes controls more accessible. Hand wheel is easier operated by right hand. Large dials are direct reading. Compound rest dial is mounted at an angle preventing interference with cross feed handle.

Tailstock slide adjusting handwheel travels with center and is in easy reach. When carriage is near center of bed all operating controls can be reached with a single step in either direction saving the operator lots of effort in a day's time.

BOYÉ & EMMES
MACHINE TOOL COMPANY
117 Caldwell Dr., Cincinnati 15, Ohio



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YOUR FIRST and WISEST CHOICE

Eliminate fumbling and guessing when gaging Holes, Slots, Finding Centers, Locations, Etc. Horberg Drill Size Pin Gages are accurate to $\pm .0001$ — .0000.



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DEPENDABLE GAGING

• Overall Length $1\frac{1}{2}$ " • Lower Half Concentric Tapered for Easy Insertion and Alignment for Holes down to .0012 smaller • Oil Hardened Tool Steel. No other pin gage has such accuracy at so low a cost.

INDIVIDUAL STOCK SIZES \$1.00 each

LETTER SETS: 52 gages from A to Z—\$45

FRACTION SETS: 60 gages $\frac{3}{64}$ " to $\frac{1}{2}$ " in steps of $\frac{1}{64}$ "—\$50

NUMBER SETS: 120 gages 1 to 60—\$90

Sets come in pairs for gaging any number of similar holes. All sets include stands of 3 plates and cover, so that gages stand upright. Drill size is plainly stamped in front of each hole, together with decimal equivalent to the ten-thousandth of an inch.



Prices F.O.B. Bridgeport, Conn. Immediate Delivery.

THE *Horberg* GAGE COMPANY

19 STAPLES STREET, BRIDGEPORT, CONN.

WORK *not* WEIGHT

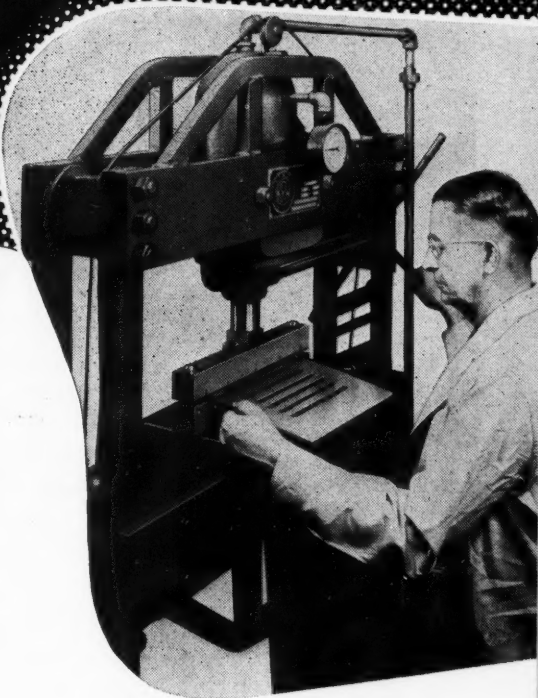
Proves KRW *Value*

● KRW Hydraulic Presses—either Hand operated, Air operated or Motor driven—are so flexible in design and operation, that a little ingenuity plus a few simple and inexpensive dies often result in tremendous time and cost savings.

Gone is the old fashioned theory that most forming, blanking and stamping operations must be done on large, cumbersome presses. On the small run production job illustrated here, a farm machinery manufacturer was able to save considerably in both die and production costs by utilizing a standard KRW 75-ton press and low-cost dies as shown at the right.

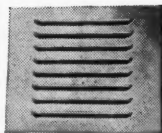
Today, the term "arbor press" is a misnomer. In countless plants KRW Presses are doing thousands of jobs that, a few years ago, would have been done on larger equipment. KRW Hydraulic Presses are built in sizes varying from 25 to 100-ton capacities. All but the 100-ton press can be furnished as either hand operated, air operated or motor driven. Openings, bed widths, heights, etc. can be varied at very little extra cost to meet particular needs.

Before you buy a press, remember this truth—more often than not, "you don't need a sledgehammer to drive a tack." You can save plenty by bringing your production problem to KRW first. We're equipped engineeringwise to offer real help, no obligation of course.



INEXPENSIVE DIES AND A KRW PRESS

Illustrated at the left are the low-cost dies used by John L. Bubb Farm Machinery Co. of Baldwinville, N. Y. on their KRW Press to form louvers in 16 ga. sheet steel as shown at the right. 3 tons pressure is required to shear and 10 tons to form the louver. This is a highly economical set-up for the limited production necessary.



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K·R·W·WILSON

K. R. WILSON, 215 Main St., Buffalo 3, N. Y.

16

Please send me complete information on KRW Arbor Presses ☐
100-ton Hydraulic Presses ☐

Name

Address

**PICK THIS
BLADE**



**to Cut
Production Costs**

For longer service—often eight to ten times the life of ordinary tungsten steel blades — the GRIFFIN SPECIAL ALLOY power machine blade is your best buy. Molybdenum high speed steel, with strong, raker-set teeth. Made also in hand frame sizes.

OTHER GRIFFIN BEST BUYS


For clean, accurate cutting of tough alloy steels, pick the GRIFFIN HIGH SPEED STEEL blade; 18-4-1 tungsten high speed steel; in power machine and hand frame sizes . . . For general hand frame use, pick the improved NEW GRIFFIN; flexible as a soft-back, tough as an all-hard . . . For sawing thin sheet or tubing by hand, pick the GRIFFIN NON-STRIP, with the teeth that don't break off . . . For precision contour sawing pick GRIFFIN BAND SAWS—choice of hard-edge-flexible-back, spring-temper, skip-tooth and wood-cutting types.

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GRIFFIN 

HACK SAW BLADES and BAND SAWS

MADE BY G. W. GRIFFIN CO., FRANKLIN, N. H.
Hack and Coping Saw Blade Specialists Since 1880

NEW, TYPE-DX

HEAVY DUTY

Shoplifter

Two Capacities

2000 lbs. and 1000 lbs.

A larger, huskier version of the popular Type D 500 lb. Shoplifter, but retaining the easy handling features of the smaller lifter. Platform and base frame have an overall width of 24" that allows easy passage in narrow aisles, between presses, and through doorways. Hoisting unit is ball bearing equipped. Automatic friction-disc brake holds load at any point, not necessary to set or release pawl or brake device. Only 20 lbs. pressure is required on crank handle to raise or lower load. Extra heavy construction gives rigid stability that enables the operator to handle maximum loads with ease and smoothness. No other lifter of equal capacity on the market can match the Shoplifter for value. One user said: "It's a lot of machine for the money."

SPECIFICATIONS

CAPACITY—1000 lbs. and 2000 lbs.

OVERALL HEIGHT (to clear)—6'8".

PLATFORM LIFT—54".

PLATFORM PLATE—24" wide x 27½" long (30" out from uprights).

BASEFRAME—24" wide x 50½" long overall. Open end front.

BASE WHEELS—5" fixed wheels, 6" swivel casters with push bar steer.

HOIST UNIT (two capacities)—Ball bearing equipped, crank up and down action, automatic safety brake holds load at whatever point raised. Drum scored for cable.

PAINTED—Standard olive green finish.

PRICE—1000 lb. capacity.....\$320.00

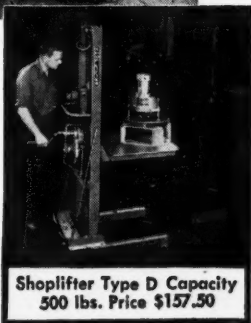
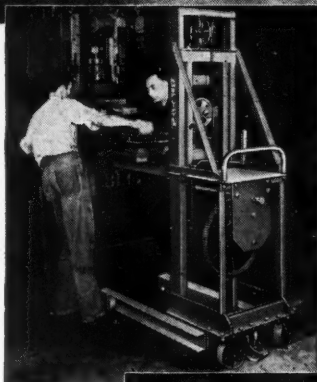
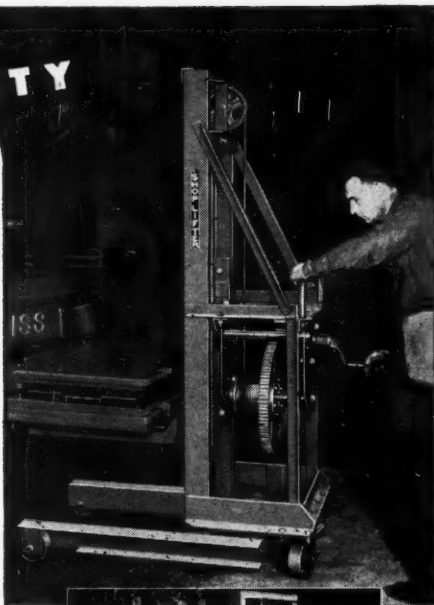
2000 lb. capacity.....\$370.00

f.o.b. Chicago, freight prepaid to any destination in U.S.

Heavy duty foot operated floor lock.....\$15.00 Extra

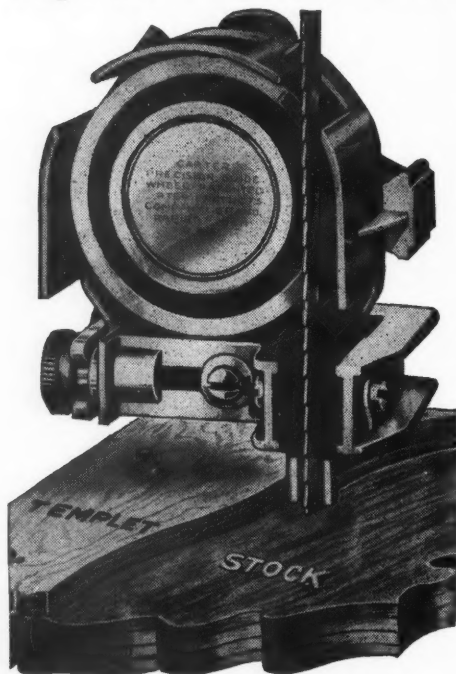
ECONOMY ENGINEERING CO.

4507 W. Lake Street, Chicago 24, Illinois



Shoplifter Type D Capacity
500 lbs. Price \$157.50

USERS Acclaim **TEMPLATE PIN** Feature of **CARTER Micro-Precision GUIDE** *Pays for Itself in Few Days Sawing Operations*



**Carter Micro-Precision Guides
with Templet Pins**

Carter Rigid Band Saw Wheels

Carter Quick Change Tires

C A R T E R **PRODUCTS COMPANY**

**959 Michigan Trust Building
Grand Rapids 2, Michigan**

Thousands of **CARTER Micro-Precision GUIDES** with **TEMPLET PINS** have been shipped to bandsaw users throughout the United States and Canada since the introduction of this feature last Spring.

These users declare it is the finest Guide on the market today . . . that it saves thousands of dollars in time and materials . . . In fact, the **CARTER GUIDE** with **TEMPLET PINS** saves enough money to pay for itself in a few days sawing operations.

The addition of **TEMPLET PINS** to your **CARTER Micro-Precision GUIDE** enables your operator to saw more pieces per hour with increased accuracy, as costly and inaccurate marking of stock is eliminated . . . **TEMPLET PINS** also permit sawing of normal band saw sweeps.

WRITE TODAY

You, like progressive Manufacturers across the continent, will be interested in the time and money saving features obtainable with **CARTER Band Saw Equipment**. We invite your requests for full details.

Band Saw **WHEELS • TIRES • GUIDES • GUIDE LIGHTS**

YOUR NEIGHBORHOOD "steel bar store"

**OFFERS YOU COMPLETE, DIVERSIFIED STOCKS
OF COLD FINISHED STEEL BARS AND SHAFING**



Just make out your "shopping list" from your nearby Union Drawn Distributor's stocklist. Then call him on the phone and have him fill your order. It's as simple as that. No need to stockpile supplies or accumulate inventories top heavy with rarely-used sizes. Use your distributor's warehouse as your stockroom—and save the expense of operating your own. "We deliver—but FAST" could be a motto adopted by this "store." Large orders, small orders get immediate attention. They're on their way to you within minutes of your call. Keep your Union Drawn Distributor's phone number handy . . . and always call him FIRST.



Republic **UNION** 
COLD DRAWN STEELS

LAW of GRAVITY Suspended . . .



**GISHOLT
Turn Mill Slides**

COUNTER-BALANCED

by

**NOPAK
AIR
CYLINDERS**

GISHOLT Model TMP-8 Crank-Shaft Turn Mill equipped with four 10" NOPAK Air Cylinders which suspend heavy cutter-slides in a column of air.

The Crank-Shaft Turn Mill pictured has two vertical columns, each of which carries 2 cutter slides, one upper, and one lower.

Each slide weighs about 550 pounds and has its own counter-balancing 10" NOPAK Air Cylinder located at the top of the vertical column. There is a constant and continuous air pressure on these cylinders, and no valves of any kind are used. As these slides are counter-balanced by air, they have no gravitational weight. Their feed-movement is controlled by hydraulic cylinders.

This unique application is one of several which Gisholt has found for NOPAK Cylinders or Valves in building its line of Machine Tools. You can use them to advantage in your product . . . or in your plant.

GALLAND-HENNING MFG. CO., 2758 South 31st St., Milwaukee 7, Wisconsin

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APPLICATION MANUAL**

**REPRESENTATIVES
IN PRINCIPAL CITIES**

NOPAK
VALVES AND CYLINDERS
DESIGNED for AIR and HYDRAULIC SERVICE

A 5464-1/2 I-A



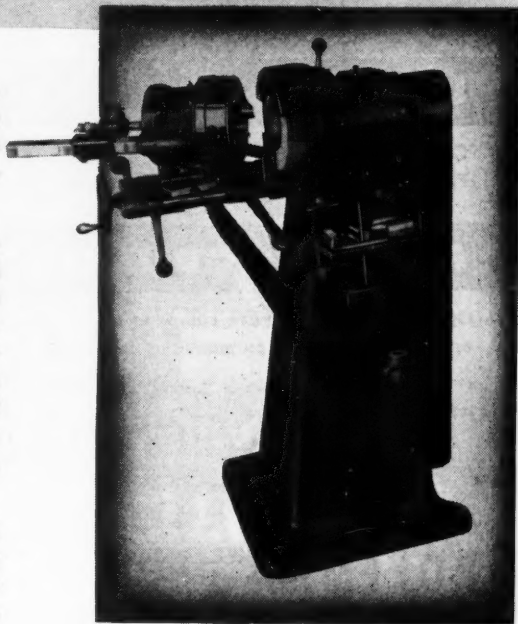
*For the Only Theoretically
Correct Point—Use the*

OLIVER "510" DRILL POINTER

The point form produced on the OLIVER Drill Pointer has been judged by competent authorities to be "theoretically correct, and practically perfect."

OLIVER pointed drills show a gradually increasing clearance toward the center of the drill, with less chisel point angle, reducing thrust. To you, this means more holes drilled between grinds, longer overall drill life, and *uniformly ground points*. (This can best be tested on multiple spindle drilling operations, where all points must drill alike.)

The OLIVER "510" will grind all drills from $\frac{1}{4}$ " to 3", with the proper point angle and clearance for your job. The operation is automatic—produces drills that last longer than those sharpened by hand.



Send us a few drills to sharpen without cost. You can see the improvement—test them on your own job.

WRITE TODAY FOR "510" CATALOG

THE OLIVER INSTRUMENT CO.
1430 E. Maumee St., Adrian, Mich.

IMPROVE YOUR TOOLROOM
IT'S THE BACKBONE
OF PRODUCTION

OLIVER
OF ADRIAN

AUTOMATIC DRILL GRINDERS
TOOL & CUTTER GRINDERS—DRILL
POINT THINNERS—TEMPLATE
TOOL GRINDERS—FACE MILL
GRINDERS—DIEMAKING MACHINES

FEWER WHEELS

With grinding wheels approaching 50% of the total cost to grind high speed tool steel, plant installed a Hoffman Flotation System, to serve 4 grinders.

Result: 88 grinding wheels saved yearly

→ \$8960.00

LESS OIL

Coolant saved by clarification in the Hoffman Flotation System amounted to 600 gallons in first year.

→ 216.00

MORE PRODUCTION

Operators no longer have sumps to clean—they stay on production. Saved on manhours for sump cleaning.

→ 204.00

Total Savings for 1 year \$9380.00

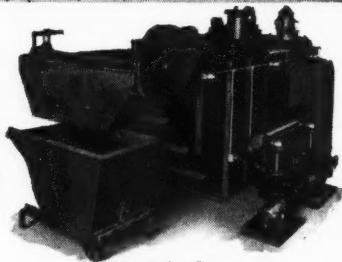
All yours with

HOFFMAN



FLOTATION EQUIPMENT for
Automatic coolant clarification

Convert "down" time into production time. And get savings on coolant, wheels and maintenance *more than enough* to pay back your investment. That, in very brief, is the story on the HOFFMAN Flotation System for coolant clarification. To get the complete details,



Models from
20 to 1,000 g.p.m.

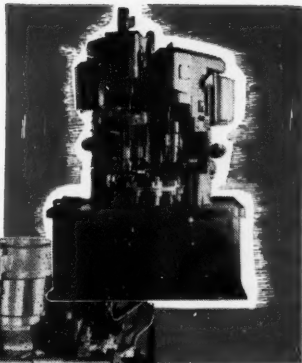
Visit Booth No. 838, National Metal Exposition, Philadelphia, Oct. 25-29

U. S. HOFFMAN

MACHINERY
CORPORATION
213 Lamson St., Syracuse 6, N. Y.

COOLANT FILTERS • FILTRATION ENGINEERING SERVICE

**MACHINES LIKE THIS
ARE WINNING THE
BATTLE OF COSTS**



**KAUFMAN #70
VERTICAL
DIAL FEED
MACHINE**

with

CUSHMAN POWER CHUCKS

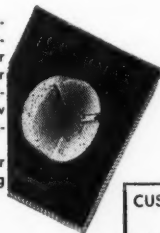
Yes, this is a typical example of how an every-day product (iron conduit connectors), that has to be made economically, now "rides the merry-go-round" on a single five-station automatic machine. Previously it passed from hand to hand through successive individual operations.

Certainly it has been done many times before . . . and always with spectacular time and cost savings. But this application is a

A World Standard for Precision

little different in that the parts are larger, the machinery loads comparatively heavy, consequently requiring Cushman Power Operated 2-Jaw Chucks of specially adapted design, hardened all over to assure maximum wear and maintained high accuracy under constant duty conditions. Each chuck is actuated by its own individual oil cylinder below the table. Operations include hollow milling OD, reaming ID and threading malleable iron conduit connectors in varying sizes up to 2" diameter.

Cushman Engineers will be glad to work with you on similar applications. Our data files are a mine of useful ideas on tooling for economical quantity production.



**AN ESSENTIAL PART OF THEIR
SPECIAL EQUIPMENT**

Write for Catalog PO63

THE CUSHMAN CHUCK COMPANY
HARTFORD 2, CONNECTICUT

100344

CUSHMAN also manufactures
a complete series of
WRENCH OPERATED CHUCKS
Write for Catalog 63 and Bulletins

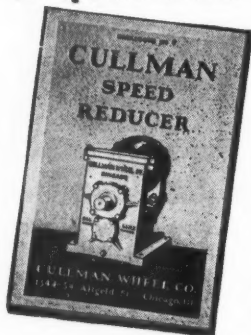
HERE'S HOW...

TO GET MORE PRODUCTION
FROM EXISTING MACHINES

CULLMAN *Speed* REDUCERS

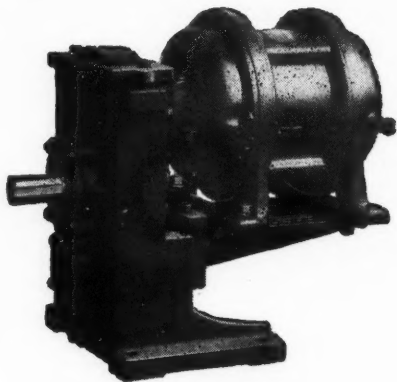
ADAPT ELECTRIC MOTORS TO SLOWER OPERATIONS

New Low-speed Range
For Motors $\frac{1}{4}$ To 15 h. p.
Fit Speeds To Job Needs



WRITE FOR YOUR COPY...

Get the facts! Ask for this helpful booklet which contains much useful data and facts for buyers. It describes Cullman Speed Reducers and other Cullman products.



Any standard electric motor can be adapted for many new uses by adding a Cullman Speed Reducer. Compact, dependable, efficient—Cullman Speed Reducers are made in single and double reduction types. Cullman units are equipped with Helical Gears, Roller Bearings, Sprockets and Roller Chains all operating in oil. *Installation is simplified by convenient motor mountings.*

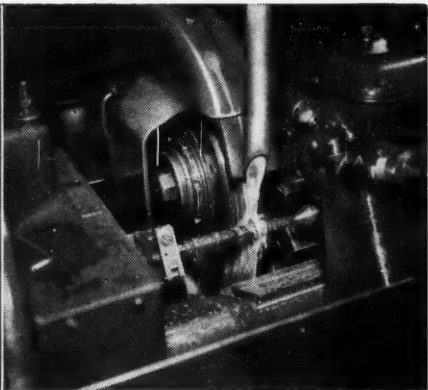
CULLMAN WHEEL COMPANY

1352 V. Altgeld Street

Chicago 14, Illinois



Cities Service cutting oil specialists have helped make turret lathe production more profitable for many of our customers.



In cam lobes grinding as in other grinding operations Cities Service Soluble fluids make fine finish possible with fewer rejects.

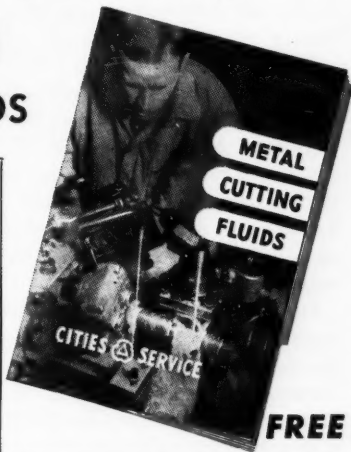
FIVE REASONS FOR SPECIFYING CITIES SERVICE QUALITY CUTTING FLUIDS

Experienced users of cutting fluids generally agree that with correct tooling and the right type of cutting fluid they can usually count on the following gains:

- ★ Longer tool life
- ★ Better finish
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- ★ Higher speeds per machine or operation
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Why not find out what the right type cutting fluid will do for you?

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Please send me without obligation your new booklet entitled "Metal Cutting Fluids."

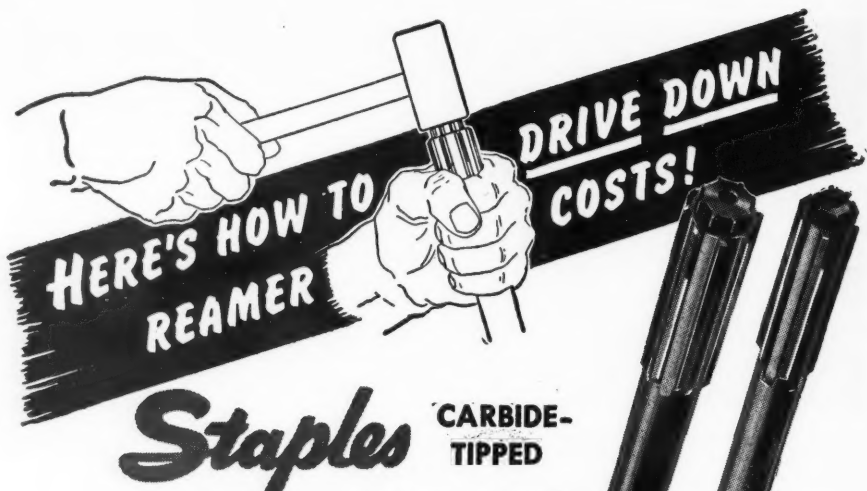
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QUALITY PETROLEUM PRODUCTS



EXPANSION REAMERS

The only expansion reamer with a solid tool body—not split—which provides rigidity and accuracy not obtained in conventional types.

To compensate for tool wear, simply drive in the tapered plug, and expand tool back to original diameter. Plug causes the arcs of the body between the cutting blades to flatten, tilts the tips back, and automatically increases the clearance angle. Expansion plug contacts tool body well beyond rear of tips, assuring uniform parallel expansion the full tip length. Cutting blades remain perfectly concentric.

Range of expansion is from .004" to .020", depending on tool size and number of flutes. Plug has taper of .020" per inch, permitting easy adjustment of tool to .0001". Staples Expansion Reamers can be expanded several times without a regrind, and without affecting hole finish.

Put these standard tools into your production now—watch your reamer costs go down on highly accurate hole finishing operations.

THE STAPLES TOOL CO., CINCINNATI 25, OHIO • DISTRIBUTORS IN MAJOR CITIES



STANDARD STAPLES EXPANSION REAMERS SOFT SHANK AND FLUTES

—For drill press, lathe and screw machine applications where guide bushings are not used.

HARDENED SHANK AND FLUTES

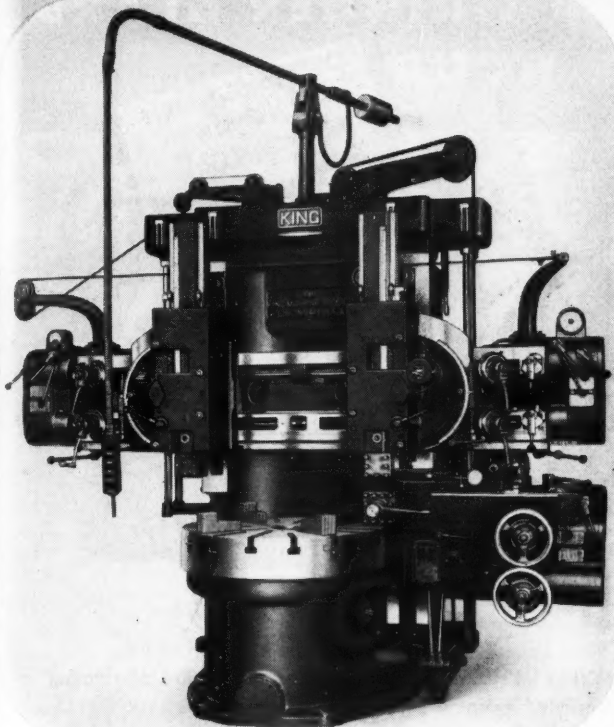
—For all types of reaming through guide bushings.

Straight Flutes — Straight and Taper Shanks from 1/4" to 1 1/2" diameter.

Staples CARBIDE-TIPPED CUTTING TOOLS

A COMPLETE LINE OF SINGLE AND MULTIPLE POINT CUTTING TOOLS
EXPANSION REAMERS • FORM TOOLS • CENTERS • MASONRY DRILLS • SPECIAL TOOLS

THERE'S A REASON WHY *The New Series* **KING**



- meets close tolerances
- maintains accuracy
- reduces costs

The New Series KING Vertical Boring and Turning Machine is easy to operate.

For example, angular hand adjustment levers with micrometer dials for vertical and horizontal movement of the head are an integral part of the head and move with it. They enable the operator to make precision adjustments easily and quickly from his normal working position.

The massive rectangular type ram heads . . . the ram heads square locked and

fitted with four tapered gibs for accurate adjustment . . . the heavy tie plate across the swivel . . . all assure high and consistent accuracy.

These features plus full range of feeds and speeds make possible maximum production at exceptionally low costs.

Consult a King Engineer on your precision turning, boring, facing, taper turning, and similar operations.

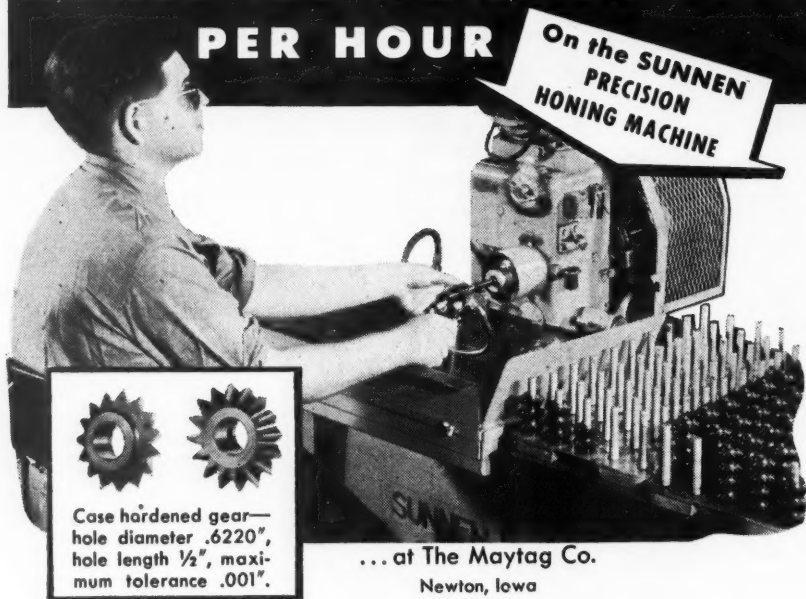
Ten sizes available, from 30" to 144"

American Steel Foundries

KING MACHINE TOOL DIVISION

CINCINNATI 29, OHIO

Blind Operator ... HONES 183 WRINGER GEARS PER HOUR



346

... at The Maytag Co.
Newton, Iowa

THREE TIMES EVERY MINUTE each operator takes a completed wringer gear off the mandrel of a Sunnen Honing Machine. The internal diameter of this case hardened gear is honed to a smooth finish: straight, round and accurate.

At Maytag five other parts are production honed to produce smooth, accurate internal diameters; to remove heat-treat distortion; to remove burrs — and

to lengthen the service life of rotating parts.

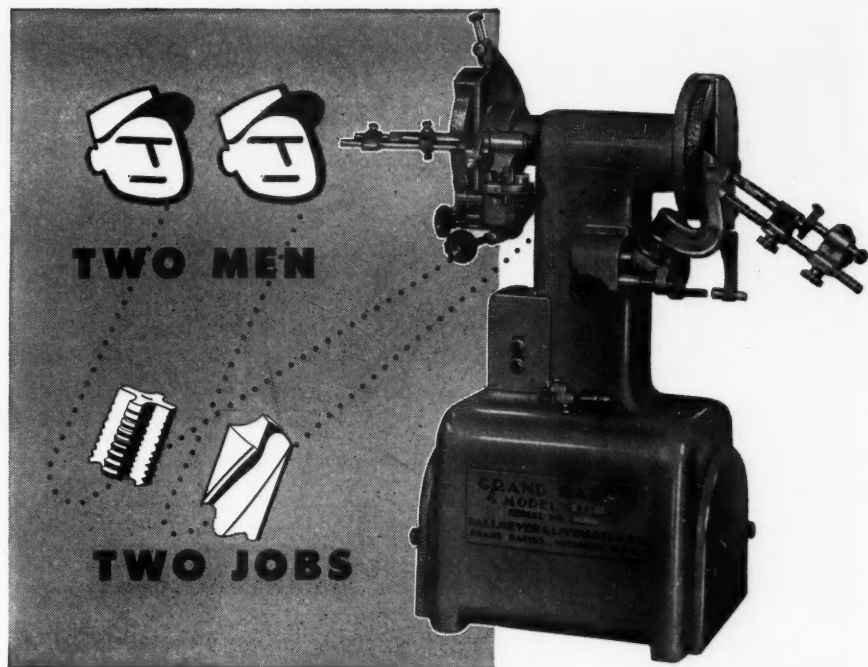
When you use Sunnen Honing, set-up time is fast, less than 5 minutes. Skilled labor is unnecessary. Operators, even girls, can be trained in an hour or less.

If your specifications call for finishing of internal diameters from .120" to 2.625" — accuracy to .0001", extremely smooth finish, it will pay you to investigate Sunnen Honing.

Write for booklet XSP-5, or, on request, a Sunnen engineer will call at your plant.

SUNNEN
TRADE MARK REG. U. S. PAT. OFF. • MARCA REGISTRADA

SUNNEN PRODUCTS COMPANY
7976 MANCHESTER AVE., ST. LOUIS 17, MO.
Canadian Factory: Chatham, Ontario



ONE MACHINE

● Working simultaneously, these men save time, floor space and maintenance costs in your tool room. Providing them with the facilities of two single-purpose machines, the Grand Rapids Tap and Drill Grinder accurately sharpens worn taps and drills to the correct cutting and clearance angles required for precision work. The rigid spindle is ruggedly built to resist heavy combined radial and thrust loads, and large wheel guards and flanges insure maximum safety. Grinding surfaces are dressed by a new, diamond truing device. The long life of this machine is assured by Grand Rapids' widely recognized reputation for sturdy, heavy-duty construction.

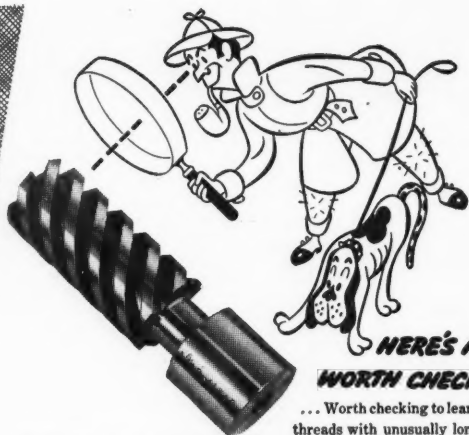
To serve you — Your inquiry concerning your specific grinding needs will receive prompt attention.

Grand Rapids Grinders include: Hydraulic Feed Surface Grinders, Universal Cutter Grinders, Hand Feed Surface Grinders, and Combination Tap and Drill Grinders.



GRAND RAPIDS GRINDERS

308 STRAIGHT AVE., S.W., GRAND RAPIDS 4, MICHIGAN

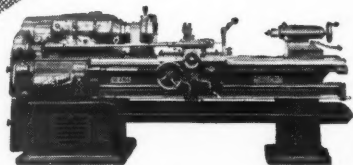


**HERE'S A LEAD
WORTH CHECKING..**

... Worth checking to learn how easily threads with unusually long leads can

be produced on the Hendey 16 x 54 lathe equipped with a Sub-Headstock. The six start worm shown above has a major diameter of 1-5/8" and a lead of 4". Producing a thread with such a long lead can impose severe strains on a lathe. Frequently, tolerances cannot be met. The Hendey lathe with Sub-Headstock avoids these problems by a unique gear arrangement. The Sub-Headstock driving plate revolves one turn to six turns of the lathe spindle. This reduces the load on the lathe to allow the chasing of threads with leads beyond the range given on the index plate.

Better check today on Hendey Precision lathes. They are manufactured in a wide range of sizes and capacities to suit every tool room use. Features include hardened and ground ways, preloaded roller bearing mounted spindles, precision lead screws and automatic lubrication. Write today for complete information.



HENDEY 18-SPEED 16 x 54 PRECISION LATHE

Other Hendey Machines Include
Tool Room Lathes — 9"· 12"· 14"· 16"· 18"· 20"· 24"
Shapers — 12"· 16"· 20"· 24"· 28"

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NEW 2G
15-TON
ROUSSELLE
PUNCH
PRESS
With the



Deep Throat . . .

ANOTHER OUTSTANDING PRESS ADDED TO THE FAMOUS ROUSSELLE LINE

HIGH PRODUCTION • LOW COST • DEPENDABLE

Ideal for sheet metal and fabricating shops. Punches to center of 36" sheets. Adaptable to trimming plastics, die castings and regular

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L-W

SWIVEL BASE MILLING MACHINE VISES

MASTER \$42.25

Jaws: 6 1/2" wide, 2" deep.
Opens 4" with jaws, 5 1/4" without.
Wt. complete with crank, boxed, 85 lb.

JUNIOR \$31.45

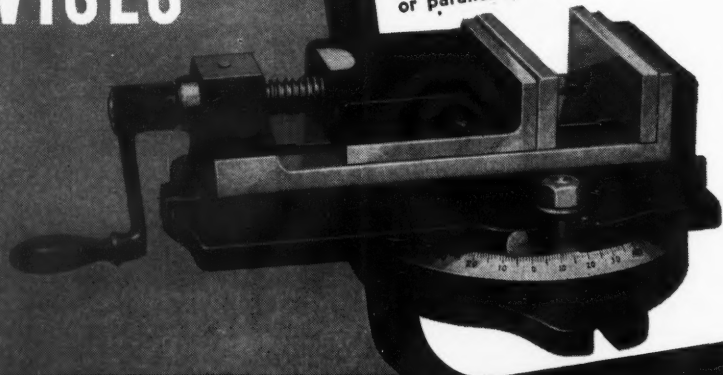
Jaws: 4 1/2" wide, 1 3/4" deep.
Opens 3" with jaws, 3 1/2" without.
Wt. complete with crank, boxed, 35 lb.

HUSKY 3" \$18.80

Jaws: 3" wide, 1" deep.
Opens 2" with jaws.
Wt. complete with crank, 16 lb.

★

STEEL JAWS
Suited to drill press and shaper work.
GRADUATED BASE
Can be used plain or swivel.
LARGE ACME STEEL SCREW
Contributes sturdiness and durability.
FOUR BOLT AND KEY SLOTS
are provided for rigidly attaching to machine table so that work holding surfaces are at true right angles or parallel to table.



Send for complete catalog giving prices and specifications on these quality, low-cost L-W Products



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MAGNETIC CHUCK



DIVIDING HEAD



RECTIFIER



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LATHE CHUCK



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POWER METER



MILLING MACHINE VISE

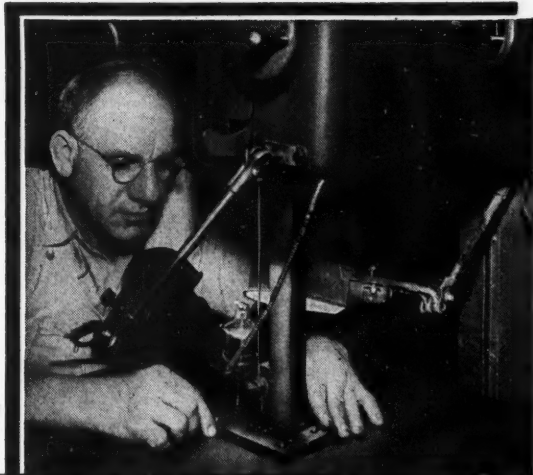
L-W CHUCK COMPANY

28 SO. ST. CLAIR ST.
TOLEDO 4, OHIO

Specify ATLANTIC

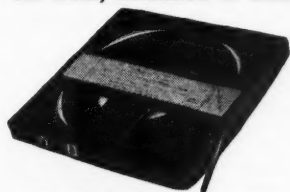
BAND SAW BLADES

*For
Smoother*



CONTOUR CUTTING

*A*TLANTIC SAWS meet all of your requirements for a superior blade on complicated die and fixture radius cutting. ATLANTIC specializes in accurate milled and precision set teeth, hardened to exact temper.



Atlantic's strong, practical box, plainly marked on sides and top. Remains in good condition until entire coil is used.

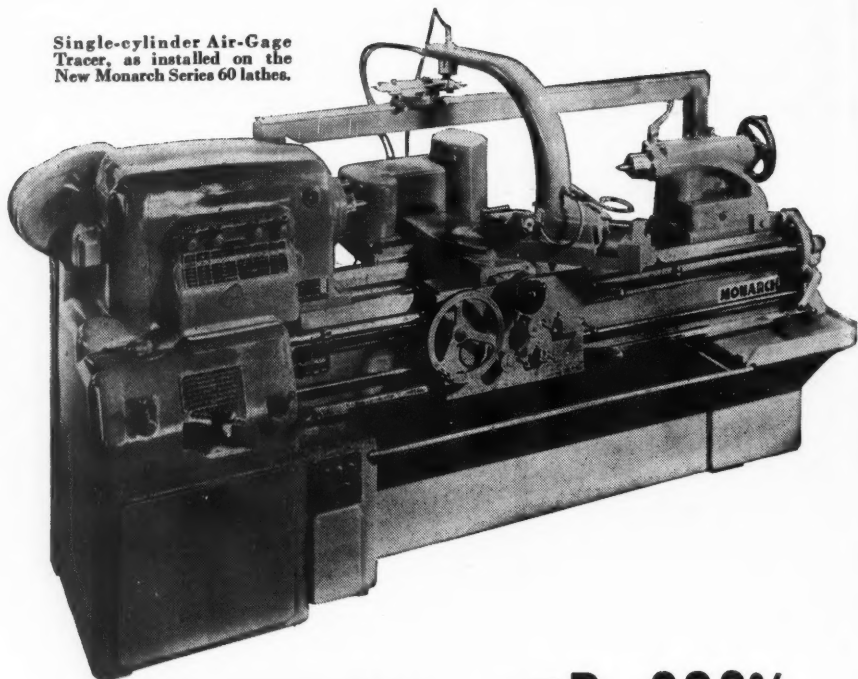
ATLANTIC'S special alloy steel insures longer wear and easier welding.

ATLANTIC'S one temper saw for all metals reduces stock you have to carry. Cut to length and welded, ready for use. Packed in strong Atlantic box. Write for new Atlantic Catalog.

Atlantic Saw Mfg. Co.
INCORPORATED

Exclusively Manufacturers of Band Saw Blades
155 Brewery St., New Haven, Conn.

Single-cylinder Air-Gage Tracer, as installed on the New Monarch Series 60 lathes.



SHAFT PRODUCTION **UPPED 362%**

With the New Monarch Air-Gage Tracer

Production time was cut from 174 hours down to 48 hours—for a large and representative lot of shafts.

This manufacturer's savings in time through the use of the Air-Gage Tracer is typical—as are the other savings made in this installation. Here's the story:

Shafts ranging in diameter from 3" to 4½" had been turned on modern manually-operated lathes, leaving .015" to .020" of stock for the grinding operation. Air-Gage Tracing holds diameter so closely (.002" on the average) that the stock left for grinding was cut in half. Grinder

costs decreased, too.

Here's the payoff. Two Air-Gage Tracer equipped machines replaced five manual machines for this manufacturer—and they're out-performing the original battery, with more production—of far higher quality.

Let us show you how these modern Monarch Air-Gage Tracer equipped machines can cut your costs on shaft work and turned or bored contours and tapers.



THE MONARCH MACHINE TOOL COMPANY • Sidney, Ohio

FOR A GOOD TURN FASTER — TURN TO MONARCH

New Sole Supplier!



Johansson Gage Blocks

now made for all Western Hemisphere
by Brown & Sharpe

With the recent purchase of the Johansson Division from Ford Motor Company, Brown & Sharpe acquired all rights to manufacture and distribute Johansson Gage Blocks and Accessories throughout the Western Hemisphere.

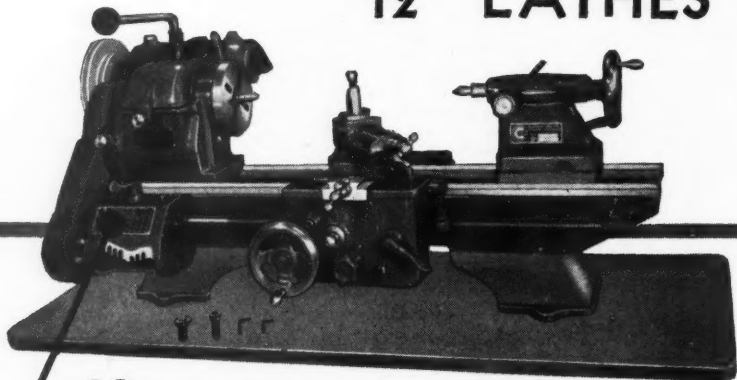
Thus, industry is assured a continuing, dependable source of supply for Johansson products of the same unprecedented precision that has made them the world-wide measuring standard in mass production of interchangeable parts. Brown & Sharpe Mfg. Co., Providence 1, R. I., U. S. A.

We urge buying through the Distributor

BROWN & SHARPE 

Clausing

DUAL QUICK CHANGE 12" LATHES



48 THREADS AND POWER FEEDS AT YOUR FINGERTIPS

ADDITIONAL

Clausing

FEATURES

- Precision ground bed with two flat and two vee ways
- Adjustable Timken tapered roller bearing headstock
- Ball bearing friction clutch countershaft
- Nine spindle speeds from 33 to 2400 r.p.m.
- Hooded V-belt drive
- Automatic apron

Designed for wide range performance and utmost ease of operation. The Clausing Dual Quick Change 12" Lathe gives instant selection of 48 threads and feeds . . . simply by shifting two levers. Gives finer feeds instantly without stopping lathe. Saves set-up time and operating time on any turning operation requiring power feed. Easy-to-read chart shows lever and gear positions. The Synchronized Gear Box is of "big machine" design and construction. Liberal use of precision ball bearings on which shafts turn readily, with a minimum of friction. Gears are machine cut, $\frac{1}{2}$ " wide for greater strength and longer life. Compare the Clausing Quick Change with lathes in this price range.



For smooth, accurate performance, greater convenience and lasting satisfaction investigate Clausing Lathes today.

CLAUSING MANUFACTURING CO.

229 RICHMOND AVE.

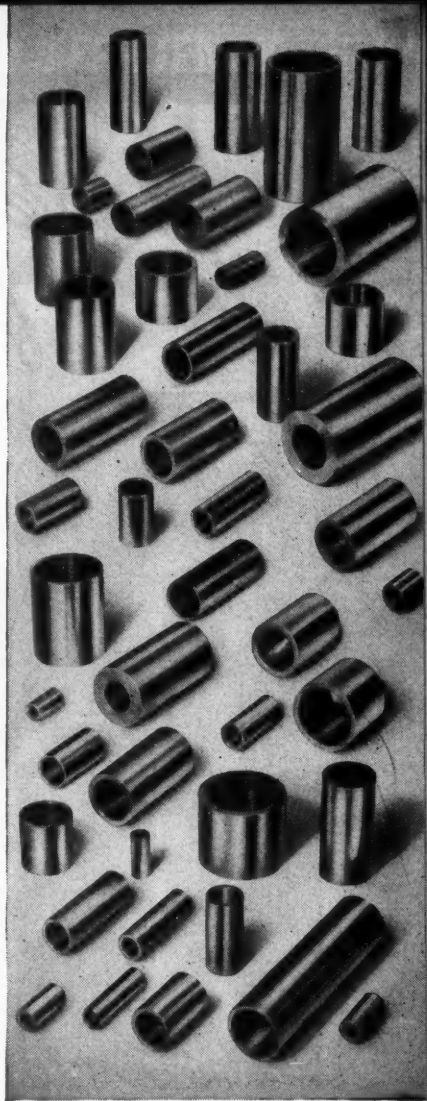
OTTUMWA, IOWA

1088 SIZES OF FULLY
FINISHED, READY-TO-USE

BUCKEYE BEARINGS

*CARRIED BY LEADING DISTRIBUTORS
FOR YOUR CONVENIENCE*

● Leading supply houses carry Buckeye Bearings to serve you better. Manufactured from selected materials under our rigid controls, Buckeye Bearings meet the most exacting specifications. Each is a quality product—free from porosity and accurately dimensioned within the required limits assuring speedy, easy assembly and a maximum of long, efficient, satisfactory service. Send for the Buckeye catalog, and order Buckeye quality bearings—by name and number—from your Buckeye distributor.



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MANUFACTURERS—
PART NUMBERS—
PERMANENTLY ROLLED
ON YOUR PRODUCTS
WILL HELP YOU MARKET
THEM.**

Send prints of parts, showing required marking and its location on part with hourly production for free recommendation.

*Illustrated at the left is
Model 135 Production
Marking Machine.*

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GEO. T. SCHMIDT, INC.

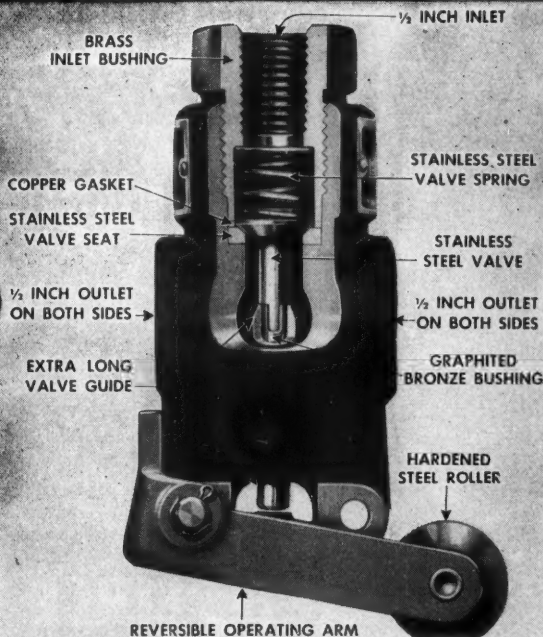
**1806 W. BELLE PLAINE AVE.
CHICAGO • 13 • ILLINOIS**

INCREASE MACHINE TOOL EFFICIENCY with

Palmer Shile **AIR SAVER** *Leak Proof* **AIR VALVE**

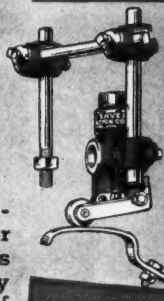
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on machines
you now
operate



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A real precision-built, leak-proof air valve that completely harnesses air power and assures split-second air control at all times. The easy-to-install Air Saver mounts in any position—operates at any angle—unaffected by vibration—provides ample air volume for operation of single or multiple jets. A natural where air is used for cleaning, drying, cooling, positioning or ejecting. Especially recommended around punch presses, die casting machinery, drill presses—and in reaming, broaching and other operations. *Immediate Delivery.*

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Complete Assembly
Includes Valve,
Mounting Rods,
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\$15.00

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CONSTRUCTION

Gives this **TAFT-PEIRCE**
NO. 1 PRECISION SURFACE GRINDER
Effortless Operation • Unusual Accuracy

The operation of this Taft-Peirce No. 1 Precision Surface Grinder is smooth and effortless because table, saddle and column travel on ball bearings retained in vees of hardened and ground alloy steel.

As a result there is practically no wear on ways and moving parts. Grinding time and wheel wear are sharply reduced. Plane surfaces can be given the highest

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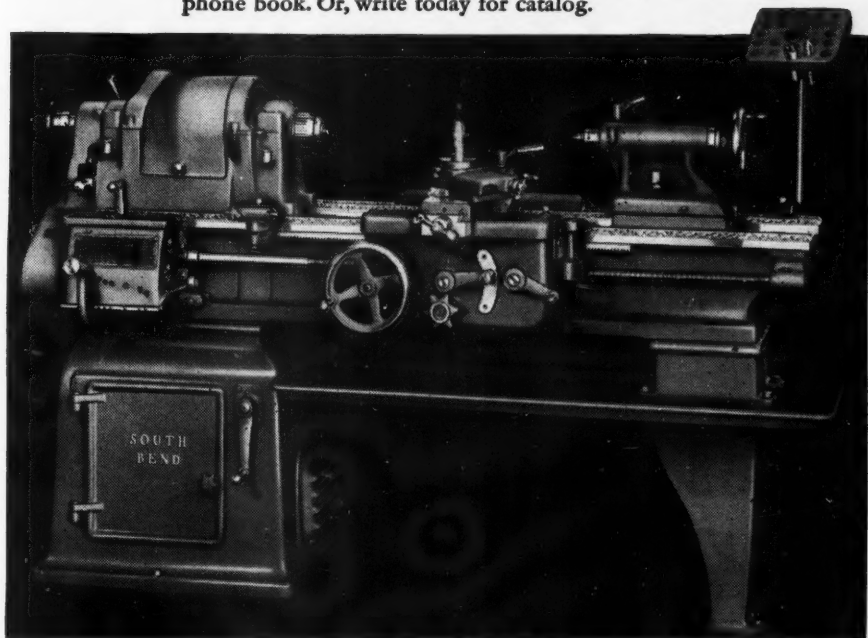
This and other exclusive features will measurably improve the output, quality and economy of your surface grinding work on parts up to 5" x 12" x 12". For illustrated booklet and prices write: The Taft-Peirce Mfg. Co., Woonsocket, Rhode Island.



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SOUTH BEND PRECISION LATHES have solved the production of precision parts for many manufacturers. Their accuracy, speed and adaptability to a wide range of operations contribute to efficient machining. Perhaps you are running some small, precision jobs on slow, heavy machines. If so, find out about South Bend Precision Lathes. These are the kind of jobs for which they are built. Their use can often effect appreciable savings. And, being reasonable in price, they can be installed without excessive capital investment.

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16" x 6' TOOLROOM LATHE with handwheel collet attachment; collet rack; taper attachment; micrometer carriage stop; chip pan; thread dial; 3 phase, 60 cycle, 220 volt motor; and drum switch. Catalog No. 8117-C. **\$2145.25**

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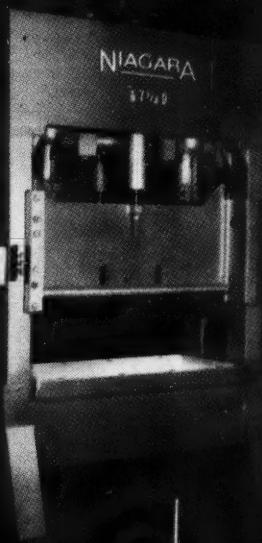
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Gap Press*

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RA

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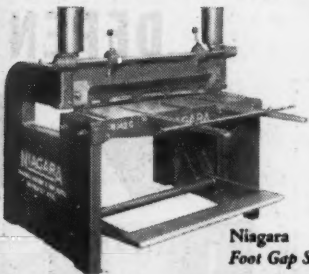


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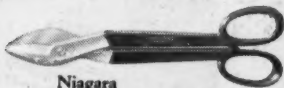
Niagara
Rivet Set and Header



Niagara
Hollow Punch

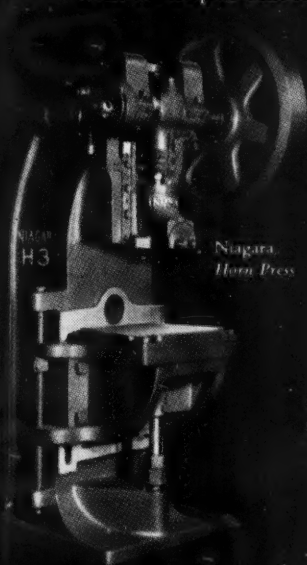


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Niagara
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chine for burring,
turning, wiring,
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elbow edging, slit-
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Niagara
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ACME BENCH VISES have ALL of these features



Maximum Gripping Power • Longer Vise Life

No Side Twist • Unbreakable Sleeve Nuts

Interchangeable Ground Jaws • Swivel Bases

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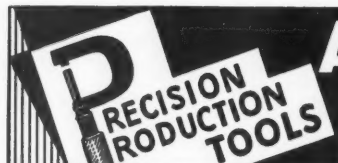
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Why is the Jacobs Plain Bearing Chuck standard equipment with 98% of all portable tool builders in the world today? It's because no other chuck offers such a powerful, accurate, durable grip at so low a price. The Jacobs Manufacturing Company, Hartford 2, Connecticut.

*Jacobs
Chucks*



IF IT'S A JACOBS

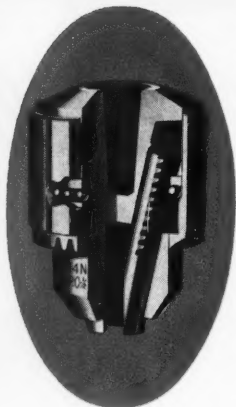
...IT HOLDS

HOW TO GET THE FACTS

For full details about sizes and prices of Jacobs Super Chucks, Plain Bearing Chucks and Rubber-Flex Tap Chucks, ask your INDUSTRIAL SUPPLY DISTRIBUTOR for Bulletins 48-M, 48-N and 48-T, respectively. The Jacobs Manufacturing Company, Hartford 2, Connecticut.

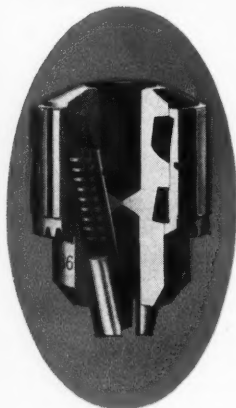
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Jacobs Chucks



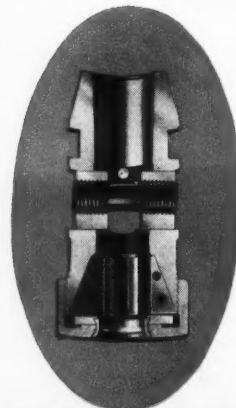
THE BALL BEARING SUPER CHUCK providing gripping power, accuracy and durability offered by no other chuck in the world today

The recently improved inserted ball thrust race and continuous deep groove, chrome nickel alloy jaws and heat-treated alloy steel nut have made this chuck the world-wide favorite for heavy-duty drilling. It is offered in six capacities from 0-1/4" to 3/4-1/2" and is highly recommended if you desire the most from your drill press, lathe, or hand screw machine.



THE PLAIN BEARING CHUCK that's standard equipment with 98% of the portable tool builders here and abroad

These light- and medium-duty, threaded and tapered back models are made to the same close tolerances as the Ball Bearing Super Chuck. Precision-ground construction of all moving parts results in a tightening action which maintains jaw parallelism for dead-center tooling. This chuck is made in ten capacities from 0-3/8" to 3/4-3/8" and is particularly designed for portable drill light- and medium-duty drill presses and lathes.



THE RUBBER-FLEX TAP CHUCK with the parallel bite that holds true and tight

All sizes of taps get a non-slip, positive drive from the floating back jaws and the parallel bite of the unique Jacobs Rubber-Flex Collet. Light weight, small diameter, firm grip and simplified tap changing combined in these accurately ground chucks. That's why they're ideal for any tapping head, tapping machine, drill press or screw machine. Three chucks handle the entire range of tap sizes from #0 to 3/8".



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Comparator **DIAL SNAP GAGES**

★ **1 1/4" BEZEL**

Small, light in weight, yet reading in .0001" with ease and proven precision.

SHOCKPROOF MECHANISM

STANDARD Shockproof construction absorbs shocks of sudden impacts without the slightest sacrifice of accuracy; assures high degree of consistent repeatability.

★ **DIRECT ACTION**

Plunger acts directly on indicator spindle, without intervention of levers; simple, dependable, avoiding loss of accuracy.

★ **LONG LIFE ANVILS**

Flat lower pin is tipped with tungsten carbide disc. Upper pin, as regularly supplied, has spherical surface, tungsten carbide tipped. If desired, gages can be furnished with two flat pins, lapped parallel, set and sealed.

Available in 8 sizes, each with range of 1". Design differs slightly with size, but accuracy is identical. Smaller sizes may be used in stands as comparators.

The efficiency of the STANDARD Dial Snap Gage is evidenced by the continual flow of repeat orders in large lots. Its simple, functional design, light weight, sturdiness and sustained accuracy, coupled with reasonable price have earned gratifying popularity in the most exacting plants. *THIN . . .* for use in narrow places; *LIGHT . . .* reducing the fatigue factor; *PRECISE . . .* easy to use, by the novice or expert, at bench or machine . . . and *DEPENDABLE, ALWAYS!*

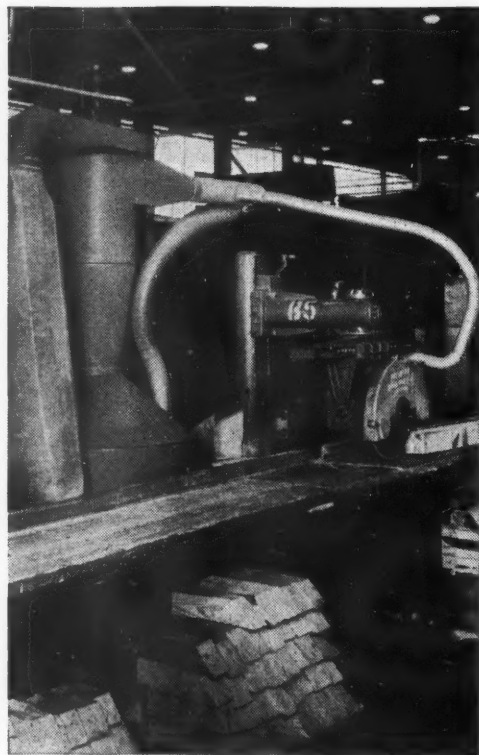
★ **INSULATED GRIPS**

Comfortable grips are heat-insulated from gage body to prevent hand warmth from affecting accuracy.

WRITE FOR COMPLETE INFORMATION

STANDARD GAGE CO., INC., Poughkeepsie, N.Y.

TORIT DUST COLLECTORS



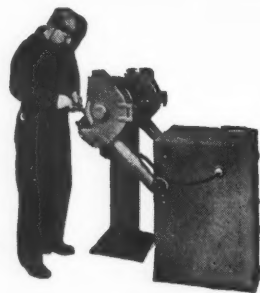
keep the
'chips from flying'
on this swing saw

Wood sawing operations are a major factory nuisance. Each cutting releases large volumes of saw dust, ranging from fair sized chips to a fine wood flour. These have an adhesive quality that makes cleaning operations difficult.

The circular swing saw illustrated here is used for cutting hardwood timbers. Suction pipes, attached to the wheel enclosure, lead to a TORIT No. 13-FB Dust Separator. The heavier particles are removed by the cyclone unit and the fine dust in the after filter.

This installation eliminates the need of a central dust system, with its maze of piping. It takes up little room. Operating only when the saw is running, it reduces costs.

Over 16,000 TORIT Dust Collectors are now cutting costs and solving the dust problem in every type of American industry. Models for all standard dust collecting jobs are now available for immediate delivery. For details and the latest TORIT catalog, write:



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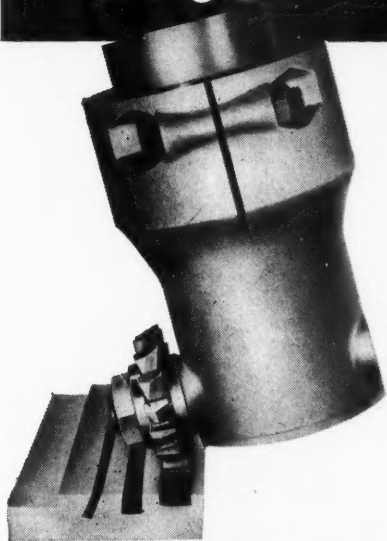
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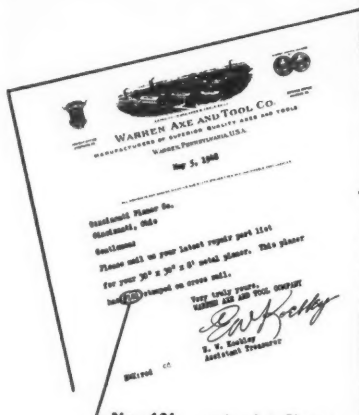
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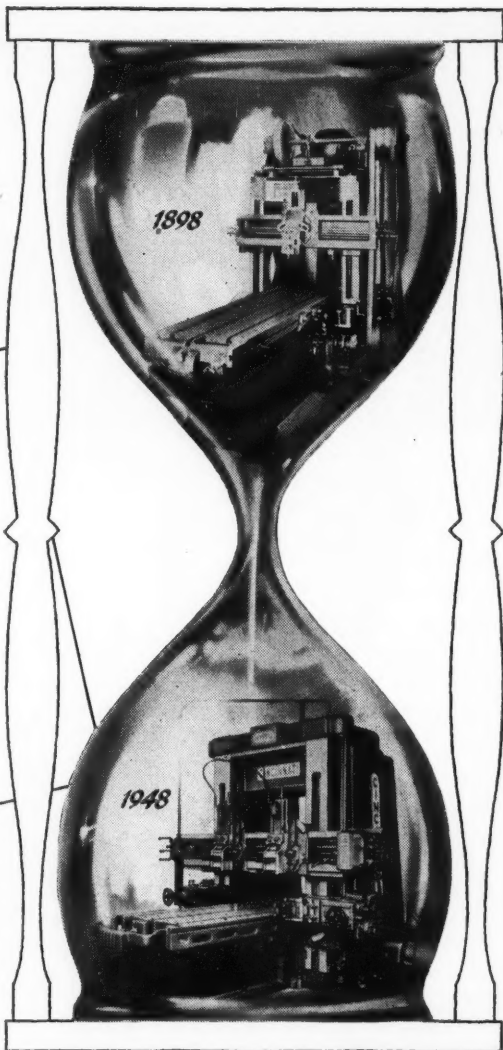
50 years



No. 101 was the first Planer manufactured by the Cincinnati Planer Company. They made a good Planer in 1898 of highest quality and finest workmanship which has stood the test of time.

Today we make an even better Planer. The modern Cincinnati HYPRO Planer, still retaining all of the Hypro-duction features and craftsmanship developed through years of experience, has been improved to incorporate new and exclusive features such as centralized finger-tip control for the complete operation of the machine, all steel hardened "twin" helical gear train, double nuts on both saddle and down slide screws, inverted dovetail slides, double acting tool block abutment, centralized dual saddle control and precision adjustment handles. These features provide increased production, lower planing costs and convenience to the operator.

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PLANERS · BORING MILLS · PLANER TYPE MILLERS
CINCINNATI, OHIO

Subsidiary of the Giddings & Lewis Machine Tool Co., Fond du Lac, Wis.

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... pay for themselves—fast ...

in TOOLS SAVED!

Shop experience proves it: Prosser Grinders reduce waste and breakage of costly cemented carbide tools—and help them deliver more cuts between grinds. Also equally effective for stellite and high-speed steel.

QUICK SETTING. The famous Prosser index device speeds setting of table to desired angle. Table need never be raised or lowered—and once set, it stays put.

MORE WORK PER WHEEL. Easy compensation for wheel wear. Wheel face can be kept close to edge of table . . . wheels can be used up practically 100%. Fewer wheel changes, more time and money saved.

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Model AA
for dry
grinding

Model EE
for grinding
dry or wet

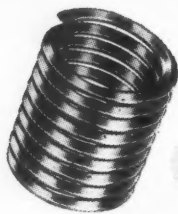
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Established
1845

THOMAS PROSSER & SON

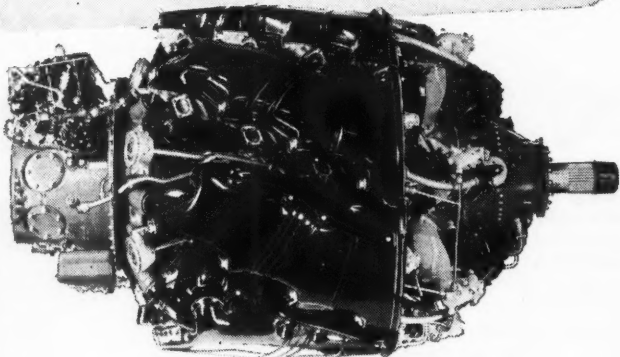
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HELI-COIL* SCREW THREAD INSERTS



*surpass
where specs are rigid*

Easy TO INSTALL



PRATT & WHITNEY AIRCRAFT use more than 200 Heli-Coil and Aero-Thread Inserts in their 3500-horsepower Wasp Major Engine, the most powerful radial engine in regular service.

Original equipment applications of Heli-Coil Inserts carry the names of many others of America's leading manufacturers. In automotive, railroad and industrial machinery—wherever specifications are most rigid—there you will find Heli-Coil Inserts.

Heli-Coil Inserts are precision-shaped coils of stainless steel wire that fit tapped threads in any standard screw profile. They protect and strengthen the threads in the parent metal and provide a durable thread surface that is strongly resistant to abrasion and stripping.

● **Production salvage** is another important application of Heli-Coil Inserts, saving thousands of dollars in otherwise expensive thread repair operations.

The Society of Automotive Engineers, Inc., has recently issued new Aeronautical Material Specifications AMS 7245 and AMS 7247, covering Heli-Coil Insert material information. Write for copies.

Send for full information.
Engineering Representatives in Principal Cities



HELI-COIL CORPORATION

Formerly AIRCRAFT SCREW PRODUCTS COMPANY, Inc.

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...where hardness testing
ACCURACY begins

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See these machines and accessories at our
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WILSON

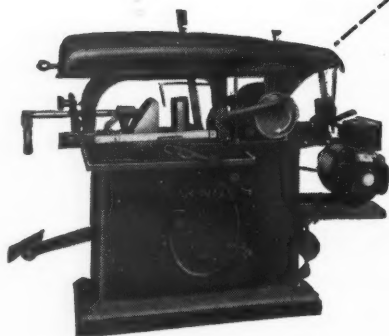
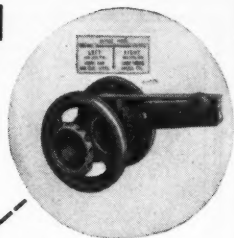
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AN ASSOCIATE COMPANY OF AMERICAN CHAIN & CABLE COMPANY, INC.

230-G PARK AVENUE, NEW YORK 17, N. Y.



New Patented Feed Control Provides 0 to 70 Pounds Pressure to Saw Blade



Keller No. 3 Hy-Duty
Power Hack Saw
\$375.00 f.o.b. Factory

New No. 3 Hy-Duty Keller Power Hack Saw has a patented feed control. An easy turn of a hand wheel quickly applies the proper pressure to cut everything from thin wall tubing to the heaviest bar stock at maximum cutting speed . . . without injury to saw blades.

OTHER FEATURES

Standard equipment includes automatic lift on reverse stroke . . . quick acting swivel vise . . . automatic safety stop switch . . . chip free vane type coolant pump . . . new adjustable foot lift and numerous other features.

KELLER POWER HACK SAWS MADE IN 8 MODELS

From the 8 models of KELLER Power Hack Saws, ranging in price from \$80.00 up, you can easily select the unit for your job.

Ask your dealer about these outstanding
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Sales Service Machine Tool Co.

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Completely finished
in 21 operations* on 1
NEW BRITAIN CHUCKER



*Illustrated at right,
 close up of 4, 5, 6,
 7 and 8 positions.*

This aluminum balance wheel is converted from rough casting to completed part at the rate of 150 an hour. By finding better methods such as this, the manufacturer succeeds in holding profit margins while keeping the price of one of the best-known sewing machines in line.

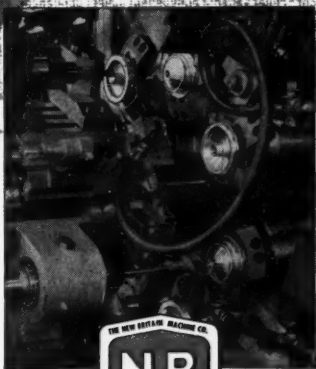
Twenty-one operations are performed on a double index New Britain Model 98 Chucker. An excellent finish results and a tolerance of $\pm .002$ is held at two important points.

When a single machine can perform a wide variety of accurate cuts, eliminate all second operations and turn out finished pieces at a high rate... that's money-making *production*. You'll find it at its peak where fast, adaptable, accurate New Britain Automatic Screw Machines and Chuckers are at work.

For other examples, write for New Britain's portfolio of actual Cost Histories, yours for the asking.

1048HG2

**For details write for Bulletin 98.*



NEW BRITAIN

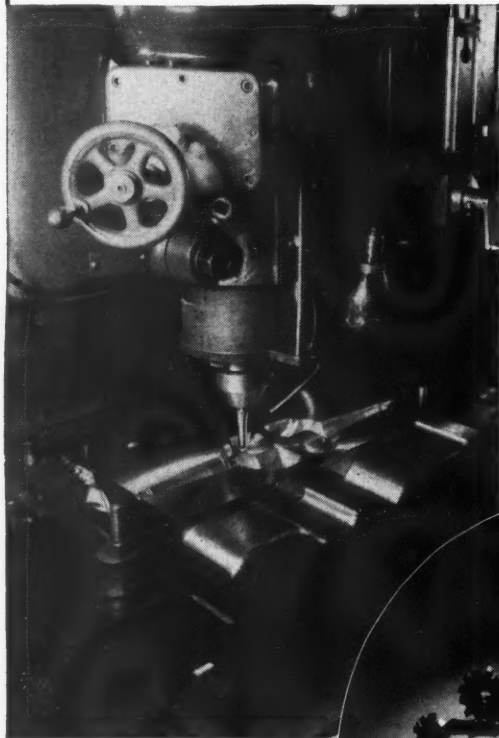
Automatics

**THE NEW BRITAIN MACHINE COMPANY
 NEW BRITAIN-GRIDLEY MACHINE DIVISION
 NEW BRITAIN, CONNECTICUT**

Raise the Feed!

CUT COSTS WITH

T-J CUTTERS



A T-J Cutter at work on a drop hammer die block for steering knuckles. The material is molybdenum die steel of C45-C50 Rockwell.

Do your cutting in tough die steels *faster...with less breakage...and more work between grinds!* Use T-J Die Sinking Milling Cutters! They're designed for accuracy and sturdiness ... made from a standard, extremely high grade steel ... properly machined ... scientifically heat-treated and accurately ground. Many styles and sizes ... proved on countless tough jobs! Send for new catalog. The Tomkins-Johnson Co., Jackson, Mich.



FOR TOUGH JOBS SPECIFY



TOMKINS-JOHNSON

DIE SINKING MILLING CUTTERS

Photos Courtesy Kropp Forge Co., Chicago, Illinois

where jobs
Challenge
equipment

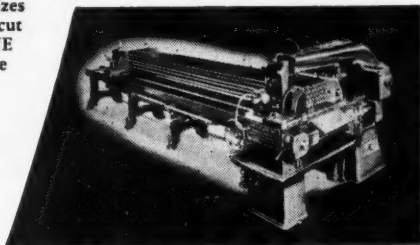


CUTTING 20" DIE BLOCK

RACINE MACHINES get out the work

Out on Chicago's west side, the Kropp Forge Company puts RACINE Heavy Duty Hydraulic Metal Saws to a real performance test. In this modern forge shop, billets and blooms are cut to proper lengths for forging. Finished forgings are sawed to specified dimensions in a wide range of sizes and steel grades. Huge die blocks are also cut to working size as shown to the right. RACINE Automatics are used for high speed multiple cutting work.

RACINE'S line of metal cutting saws is complete. They are hydraulically operated to assure smooth, oil-cushioned, positive and efficient cutting of any metal. Models are available in a wide range of sizes from 6" x 6" to 20" x 20" capacity. Write for Catalog No. 12. Address Racine Tool & Machine Co., 1770 State St., Racine, Wis.



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ENGINEERING CO.

"Series 600"

WHYTE ROLL FEEDS

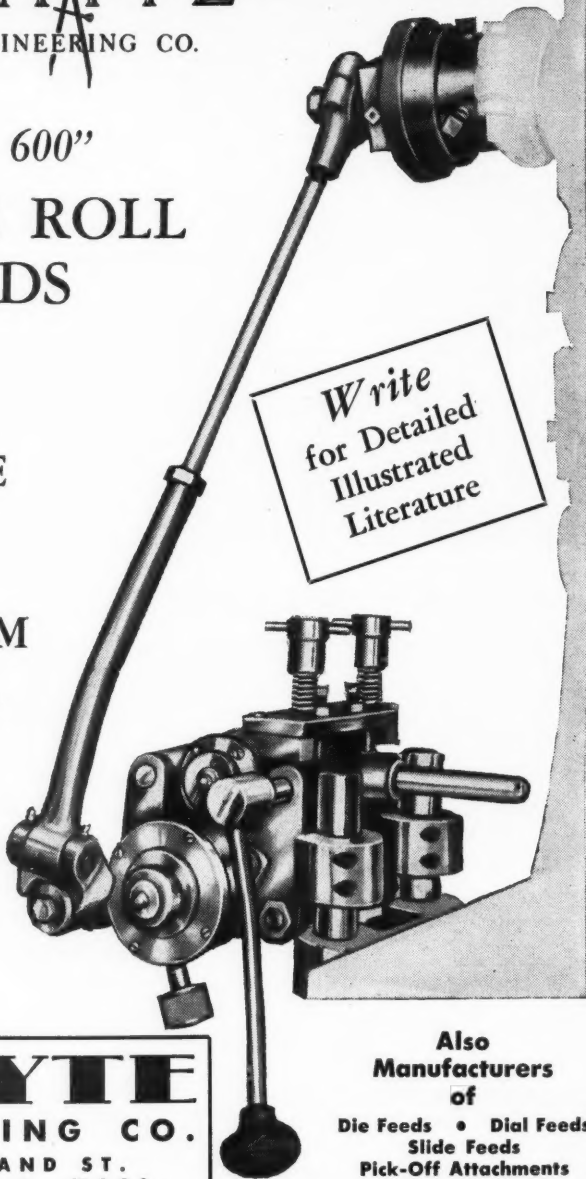
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INCREASE
YOUR
PRESSROOM
CAPACITY



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Manufacturers
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Why take a chance..



You can tell at a glance

...with **P-K** SIZE MARK

*REG. U. S. PAT. OFF.



SOCKET HEAD CAP SCREWS

ONE QUICK GLANCE tells you the size of a P-K Size-Marked Gear Grip Socket Head Cap Screw. No need to "mike" or gauge it... no chance for error! New workers learn faster—can work faster. Servicing and repair work on your product is simpler and easier.

GEAR GRIP prevents slipping and fumbling, speeds assembly, especially when busy hands are oily.

EVEN EXPERIENCED MEN need the Size-Mark, because tests show that many guess wrong on size and thread pitch. That means time out to find out.

LET THIS DOUBLE FEATURE—the Size-Mark and Gear Grip—save you time and trouble. Only P-K offers both in Socket Head Cap Screws. Ask for samples. Parker-Kalon Corp., 200 Varick St., New York 14, N. Y.

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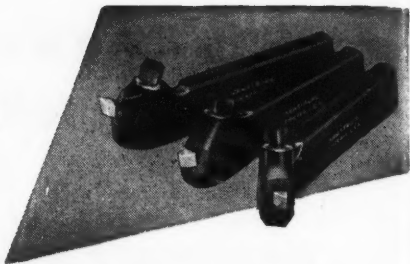


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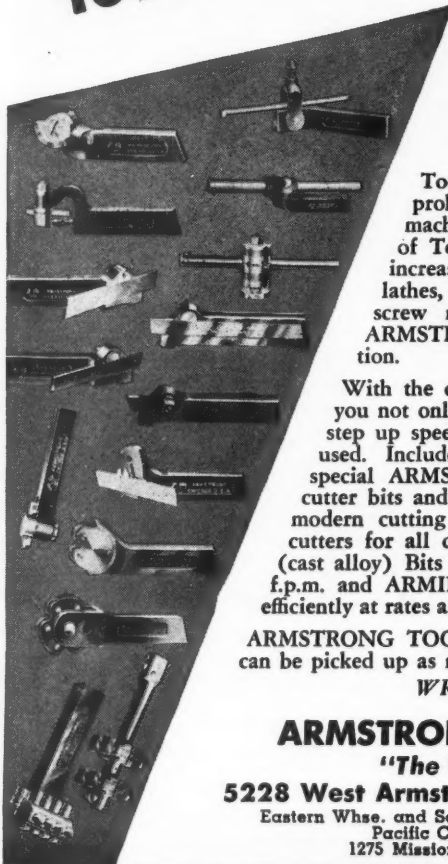
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cost with ARMSTRONG
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Today's problem of producing more without prohibitive costs is easily answered on many machining operations by the Armstrong System of Tool Holders. It is possible to materially increase output per man hour on your present lathes, planers, slotters, shapers, turret lathes and screw machines, by simply using the correct ARMSTRONG TOOL HOLDERS for each operation.

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ARMSTRONG TOOL HOLDERS, Bits, Blades and Cutters, can be picked up as needed from your industrial distributor.

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"The Tool Holder People"

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MODERN Machine Shop

OCTOBER, 1948

VOL. 21, No. 5

CINCINNATI, OHIO

This Month

Departing from our standard policy of presenting articles dealing with the techniques of management or with the design and application of production tools, in this month's issue the editors have attempted, by recounting stories of successful men and firms with whom most of us are familiar, to present a conclusive case for the advantages of a free economy.

Freedom—the birthright of the American citizen—should need no defense, but in these days of confusion, with economic gangsters, in some cases grasping politicians, and unscrupulous demagogues taking advantage of war-born shortages in an effort to induce the American people to surrender their birthright for a mess of “government control” pottage, the story of the advantages of freedom for the individual cannot be repeated too often.

Here are sagas of industries which have grown up within our own generation, and stories of men who, within our own generation, starting with nothing more than freedom of opportunity, have climbed to the top rung of the ladder. To such men and the organizations they have built can be given most of the credit for the high standard of living enjoyed by the American people.

May we suggest that recipients of this issue share their copies with others so that these stories exemplifying the opportunities that are available to all under the American system of freedom may reach as many readers as possible.



Howard Campbell

The American Way

By HOWARD CAMPBELL
Editor, MODERN MACHINE SHOP

WHEN the American colonists decided that the time had come to break away from domination by an old world government and from old world ideas, they drew up a "Declaration of Independence" in which they expressed their conviction that all men are endowed with three "unalienable" rights; life, liberty and the pursuit of happiness.

This statement of principle is the basis of the American system—the American way of life. Until the American Revolution, various forms of slavery and bondage were accepted institutions in the civilized world. Many of the early immigrants to the new world, who afterward became good and loyal American citizens and founded solid American families, came to this country as debt-ridden bondsmen, to be held in slavery at miserable wages until their debts were paid.

With the defeat of the British armies a new nation was born, "conceived in liberty and dedicated to the proposition that all men are created equal." In this atmosphere of freedom, life for the American people took on new meanings; Freedom by its very nature offered incentives to accomplishment. The knowledge that all citizens were free and equal under the law of the land, that no person might be molested as long as he was keeping the peace and that no man's home might be invaded without due process of law and reasonable evidence of lawlessness banished the last vestige of fear from the minds of the colonists and permitted them to focus their faculties and energies upon developing their talents for a better life for themselves and for their children.

Under freedom, the opportunity for award for achievement has resulted in the development of a standard of living which is the envy of the whole world. Unhampered by tradition, with the resources of a vast new continent upon which to draw for materials, with a fast-growing new nation as a market, citizens of this new world originated a new type of thinking in the realms of invention and production—a type of thinking which has expanded with each succeeding generation. The result has been that today America, with only 6% of the earth's area and 7% of its people, has 60% of the world's telephones, 72% of its motor cars, 92% of the world's bathtubs, 35% of the world's railroads, two-thirds of

the world's banking resources, and a purchasing power which even in days of universal prosperity was greater than that of all of the people of Europe put together.

American mass production methods—the product of “Yankee ingenuity”—began with an idea of one Eli Whitney who, in 1800, conceived the idea of producing muskets on a mass production basis through the use of interchangeable parts. The interchangeable parts system developed slowly through the earlier decades of the 19th century, but with the invention of the screw cutting lathe and the increasingly rapid development of machine tools, the interchangeable parts method of production came into more general use.

Watt's steam engine existed only in theory until 1774 when John Wilkinson invented a boring mill with which a cylinder could be bored so accurately that it would be tight enough to hold steam. Without the early machine tools that were designed for turning, planing, drilling and grinding, the pioneer machine tool industry upon which the industrial age is founded could never have been developed.

In the 1880's a German inventor named Otto and a man named Seldon in America invented the internal combustion engines which were later hitched to carriages, bringing about the development of the automobile industry. The introduction of the automobile into American life opened up opportunities for a high living standard and added avenues of approach to the pursuit of happiness. A comparatively high level of prosperity presented a huge potential market, and American ingenuity was applied to the development of tools and methods by which automobiles could be produced on a mass production basis and at a cost which would bring them within the reach of all. The mass production tools and methods thus developed were adopted by manufacturers of other kinds of products, with the result that the living standards of America have been raised at an ever-increasing pace.

America's unprecedented and unequalled prosperity is based upon the mass production tools developed by American engineers. Of these, the most important is the metal-working machine—commonly known as the machine tool. All machines that are made of metal, regardless of the industries for which they are made or the purposes to which they are put, are made by the use of the machine tool. The machine tool is the only machine that can be used to reproduce itself. Thus the modern American precision machine tool, developed to its utmost possibilities in an atmosphere of freedom, has played an important part in the American way of life.

American capital provides to American labor, on the average, eight times more tools and power than are available to workers in other countries. With the use of these highly developed tools the American workman can produce many times as much as workmen in other countries, who do not have the advantage of such tools. The output per man in pre-war Germany, where American methods were being copied as rapidly as possible, was less than half of production figures

in American industries; in Japan and Russia the output was still less, tapering down to a ridiculously low figure in countries where modern tools and methods had not yet been adopted.

During the war America, single-handed, out-produced the combined powers of the Axis. America was the one nation that was able to arm and equip all of its own fighting forces and still give vast quantities of arms and munitions to its allies. And now that the war is over, the nations of Europe—many of which have become engulfed in Communism—seek the help of the only nation on earth that can produce enough and give them enough to keep them from actual starvation. That nation is America.

Under American freedom and democracy, people who have saved and accumulated beyond their immediate wants can pool their surplus capital in order to set up factory buildings, buy machinery and tools, and develop industries which will provide jobs for themselves or for others. This is capitalism—and the principle of Capitalism is just as simple as that. American high production methods and machines make possible the necessities and luxuries of life at prices which make them available to all, which is the basis of our envied American high standard of living. But these high production machines must be purchased and set, and tooled, and powered so that jobs may be provided for the workers who assume the tasks of production; thus "capital" is required before production can begin.

The Continental Can Company invests \$7,127 in plant equipment and tools to make a job for one worker. On that basis, jobs for 100 workers require the investment of nearly three-fourths of a million dollars. The people who lent their money to set up these jobs received receipts for their money in the form of shares of stock which stated that they should be paid for the loan of their money, the payment to be in the form of interest or "dividends," payable at regular intervals. Without the \$750,000 to invest, the Continental Can Company would have been unable to provide these 100 jobs, 100 families would have been forced to look elsewhere for income, there would have been many less cans available to the market with the probability that cans would have been higher priced, and this capital, which otherwise would have been idle, was put to useful work.

A great deal has been said by Communists, Socialists, and many leaders of labor organizations about the amount of rent that one should receive for the use of his money, in other words, the amount of "profit" that should be paid to a capitalist. Official United States Government records show that corporate profits in 1947 amounted to about 6.2% on sales. That means that when a person spent a dollar for a manufactured article, 6c of that dollar was profit. But it should be remembered that that 6c provided all the machines that produced the article—and machines did 85 per cent of the work required for production. It is that 6c, moreover, which has made it possible for an American to buy an automobile for

\$2,000 to \$2,500 which, made by hand methods, would cost approximately \$50,000. At such a price few people could afford automobiles; thus the market would be restricted, employment in automobile factories, the oil industry, the steel mills, and other industries would be but a fraction of its present volume.

The government report shows that only 3.1% of the total national income went to stockholders last year. What happened to the rest of the profit? It was put back into the business to meet the rising costs of equipment and materials. Costs of raw materials have been rising tremendously and during the past year it has taken more money to buy them, so more money had to be made available for materials purchases. A part of this money also went to replace machines and equipment that wore out. It now costs twice as much to provide the machinery necessary to produce a ton of steel as it did before the war, and the costs of other production machines have increased in the same ratio.

The greatest paradox of the era is the fact that free enterprise is under attack by the very countries that were saved from destruction by American free enterprise during the recent war, and whose people are being fed and whose industries are being rehabilitated by the American free enterprise system today. The people of those countries are fortunate that under the American free enterprise system our production has been high enough so that we can spare the food and machines and equipment and dollars with which those countries are being restored to self-maintenance.

Communism takes the stand that "no man should be rich." Capitalism takes the stand that "no man shall be poor." When a comparison is made between the high living standards and prosperity and well-being of the American people and the low living standards and poverty of a very high percentage of the population in the foreign lands that are under Communist control, the answer as to which system is preferable should be self-evident.

American freedom means freedom to engage in business or to work where one will. Under a "controlled" economy such as prevails in countries operating under Communist or Socialist governments, the freedom of the individual is restricted. Under Communism the government owns and operates all industry, and jobs are available only to workers who qualify by declaring their allegiance to the Communist system. No worker can leave one job for another, or move from one place to another, without official permission. A worker who incurs official displeasure, either for failure to meet production requirements or for lack of enthusiasm for the system, may be deprived of his job and thus his ration card, leaving him and his family, if he has one, facing the possibility of starvation. If he becomes a public charge—which is practically inevitable—he will probably be sent to a forced labor camp, to become one more of the hundreds of thousands of slaves to their own government.

Inasmuch as Russia is the outstanding exponent of the totalitarian system of

government, let us make a few comparisons. Early in the history of the Communist regime in Russia, the government closed the churches and tried to stamp out the Christian religion in an effort to replace the Christian code of ethics, honesty and truth with crass materialism. Today the Communist party in Russia has some 6 million members out of a total population of approximately 190 millions of people, the 190 millions being forced to do the will of the 6 million by force of arms, secret police, and spies.

The vast army of secret police is maintained to prevent any Russian citizens from leaving the country and to prevent others from getting in without proper credentials; to spy out and arrest any who criticize the acts or policies of the government or its officials, and to make sure that no person leaves his job or his home or engages in any pursuits for which he has not obtained official permission.

Americans who have been in Russia report that the housing situation there is much worse than it is in America, with little prospect of relief. How does the worker fare under the Communist system? With his entire week's pay the average Russian worker can buy 22½ one-pound loaves of white bread; the American can buy 394, assuming that anyone wants that many. The Russian's weekly wage will get him 16.9 pounds of sugar; the American's, 506 pounds. The average Russian has to work seven weeks to buy a suit of clothes—and a shoddy suit at that. He must work two or three weeks to earn a pair of shoes, while the American can get six to eight pairs for a single week's pay.

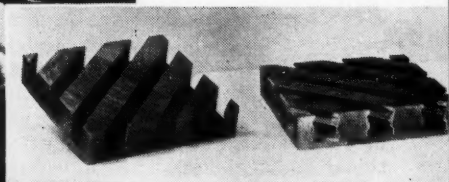
Totalitarianism—call it either Socialism or Communism—means (1) the destruction of a government of checks and balances, of principles, of rights, of parliamentary meeting of minds and popular suffrage, (2) it means government by decree, bureaucratic planning, and concentrated, irresponsible authority, (3) it means the regimentation of the people by means of the expropriation of employing capital and the taking over of the ownership of the wealth of the nation by a class of professional politicians, and finally, (4) it means the end of freedom and of free enterprise.

Our American heritage of freedom was purchased for us and has been maintained for us at the cost of hundreds of thousands of lives. Let us prove that we are still worthy of that heritage by exerting ourselves to the utmost to the end that the American way of life may be maintained.

**FREEDOM
IS
EVERYBODY'S JOB**

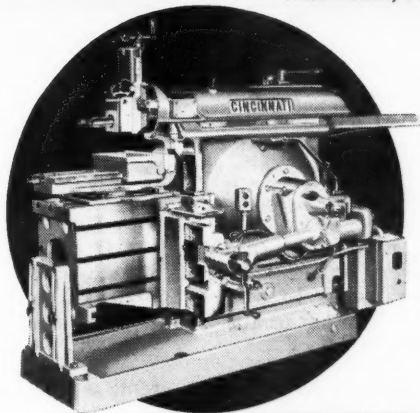
90 pieces per hour

...on this **CINCINNATI SHAPER**



Work piece is a malleable iron, Warnock diagonal block. Rate of production, 90 per hour. Specially designed gang tool holder carries six form ground high-speed tools.

Photo—courtesy Printing Machinery Co.



This high production, special Cincinnati Shaper, designed by Cincinnati engineers, is completely automatic. With a comparatively low initial cost, and low cost of tooling, it gives a high return on investment.

The operator starts the machine; the head feeds nine strokes to right, nine to the left, and the Shaper automatically stops at rear position. The operator indexes the fixture and then starts another cycle. Loading and unloading are done while the Shaper is cutting.

Consult us on your shaping job, and the possibilities of a special Shaper.

THE CINCINNATI SHAPER CO.

CINCINNATI 25, OHIO U.S.A.

SHAPERS • SHEARS • BRAKES

The Miracle of America

The Advertising Council tells how our economic system and democratic way of life have enabled us to produce more and better goods at lower cost and give the American people a standard of living far surpassing that of any totalitarian country in the world.

AN advertising and publicity campaign to explain to the American people our economic system and just how it operates will shortly be launched by the Advertising Council, a non-profit organization. This group is made up of leading companies doing national advertising, the advertising agencies, the advertising media (magazines, newspapers, radio stations, and billboards).

The Council has prepared a pamphlet *The Miracle of America* for free distribution throughout the United States, from which the following excerpts have been taken:

Have we Americans got something?

America operates under a system of political democracy and of free, competitive business activity—as American as baseball. We aim to give an open field and a fair chance to all of our people; workers, owners, farmers, business and professional people and the public in general. Admittedly our system has its shortcomings, its inequalities, its faults. We have . . . ups and downs of prices and jobs . . . poverty . . . poor housing . . . monopolies. (But) within less than 100 years, (1850-1946), we have:

Increased our output per man-hour of work more than five times—from

27 cents to \$1.41 (in terms of today's purchasing power); . . . reduced our average work-week from 70 hours to about 40 hours . . . given ourselves the highest standard of living ever known by any people at any time.

Our system has already given us:

Income: Our average annual income per household rose from less than \$2,400 to almost \$4,000 (in today's dollars) between 1910 and 1946—a two-thirds gain.



1910



1946

Education: In 1910 only 44 out of every 100 boys and girls of high-school age went to school. By 1940, there were 65 out of 100, and the proportion is rising.



1910



1940

Secret of success: "Productivity"

We have the highest standard of living in the world because we have been able to produce more goods and services in every hour we have worked. We have turned out more goods and services because we have used increasingly better machines, more power . . . and greater skills—and because we have shared the benefits in higher wages in relation to prices, greater profits, more jobs, more business.

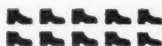
Productivity means output per worker for each hour worked:



ONE MAN
AT MACHINE



WORKING
ONE HOUR



PRODUCES
10 PAIRS OF SHOES

With a better machine, more power . . . greater skill or a better process, let's say output doubles:



ONE MAN
AT MACHINE



WORKING
ONE HOUR



PRODUCES
20 PAIRS OF SHOES

One man working one hour on a machine can now double the output of shoes. This makes possible:

Shorter Working hours: because more shoes can be made in less time.

Lower prices: because the cost of producing each pair of shoes is less.

Higher wages, greater profits, more money to expand business: because the increased income from the increased output can be divided among workers, management, and stockholders.

More jobs and more shoes for more people: because higher wages and profits and lower prices mean more demand for shoes and everything else.

All of us gain when output per hour

"SCHULTES"

The King of Motor Drives!



Unit Shown
on a Gould
& Eberhard

ALL HELICAL GEARED,
UNSURPASSED IN POWER,
EFFICIENCY, SAFETY AND
COMPACTNESS

Write for Complete Detailed Specifications.

Schultes Level
INCORPORATED

17403 GABLE

DETROIT 12

MICHIGAN

goes up; when it declines it hurts us all.

Machine power does the job

While greater skills on the job and better production methods have done a great deal to increase our productivity, the use of coal, oil, gas and water power, applied through machines, has done by far the most to increase output, income and jobs.













More machines—more goods

Increasing use of mechanical power is the secret of our ability to keep . . . productivity and . . . income going up.

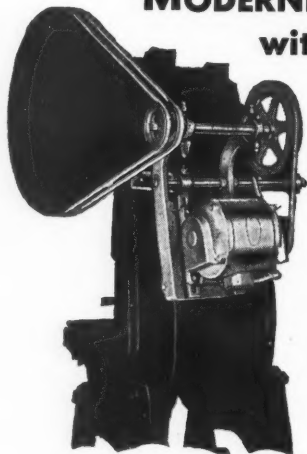
Economic freedom vs. dictatorship

Through our free, competitive American system . . . we have been able to out-produce every other na-

tion . . . and so give to our people more of the good things of life. The figures shown illustrate this. They

	1850	1900	1946
MEN	15% 	10% 	4% 
ANIMALS	79% 	52% 	4% 
MACHINES	6% 	38% 	92% 
GOODS PER HOUR	27¢ 	56¢ 	\$1.41 

MODERNIZE Your Machine Tools with MODERN MOTOR DRIVES



You get more efficiency, more economy and more horsepower to the job with MODERN "V" Belt Drives. MODERN MOTOR DRIVES utilize standard 1750 RPM motors. Drive shafts are equipped with 'Triple Seal' ball bearings . . . no need to lubricate. In use by leading manufacturers everywhere to improve efficiency of out-moded machine drive methods. Available for practically every type and model machine tool.

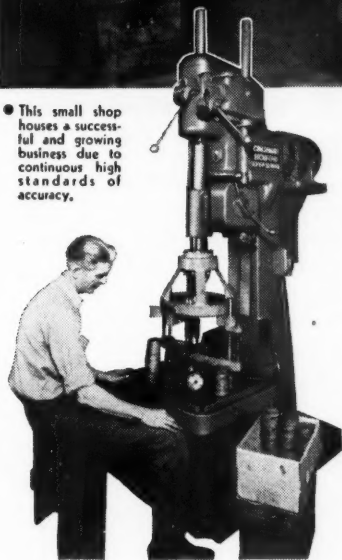
Write today for catalog. Immediate delivery.

THE NICHOLS ENGINEERING CO., MODERN MOTOR DRIVES DIV.
2400 W. MADISON ST., Dept. 618 CHICAGO 12, ILL.

4-Man Shop with a FUTURE



● This small shop houses a successful and growing business due to continuous high standards of accuracy.



Quality equipment pays the small operator as well as the large.

The Schoening Machine Service, 3284 Dunn Street, Cincinnati, Ohio—business, production machining—small in size—big in accomplishment—testifies to the value of fine tools.

The Cincinnati Bickford Super Service Upright Drill, illustrated, is drilling five $\frac{11}{16}$ " holes and four $\frac{1}{8}$ " holes to a plus or minus .005" tolerance in a steel cover $\frac{1}{8}$ " thick—a production job.

Mr. Schoening tells us he has held accuracy to a plus or minus .0002" on production reaming jobs.

Write for Bulletin No. U-25.



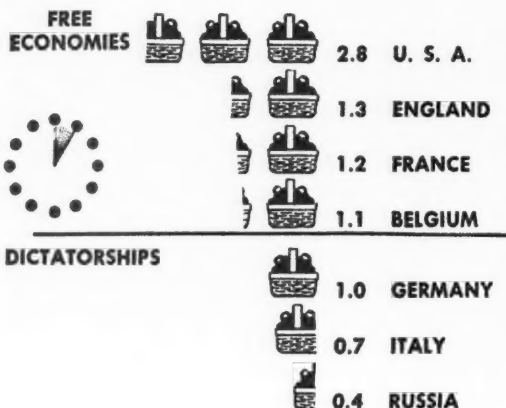
Equal Efficiency of Every Unit
Makes the Balanced Machine

THE CINCINNATI BICKFORD TOOL CO. Cincinnati 9, Ohio U.S.A.



were gathered ... in 1939, and so were not affected by the devastation caused by the war ... Imagine a

basket of 24 foods in common use. Then take the average hourly wage of a factory worker in various countries and see how many baskets of food that hour's work will buy.



What about your job—if atomic energy drives our machines?

Suppose, in the next year or two, some of the wizards of the atom-splitting business discover how to put atomic power to work in industry?

We doubt if they will, but suppose

they do get things down to a point where a spoonful of uranium, or whatever it is, will run all the autos, airplanes, ships and trains ...

... Every time a new and more efficient source of power has been developed, something really wonderful has happened in this country ... a man can turn out more goods in a day's work with the help of power than he can without it.

Challenge of the future

Even if we do no better in the future than we have in the past, the record of our actual performance shows that:

If we have no major depression

If we are at peace

If we go on increasing ... productivity (and sharing the benefits) as we have in the past, we can have by 1960:

More Jobs

More Vacations

Greater Output

Higher Income

Increased Travel

Better Schooling

Greater Population

More and Better Food

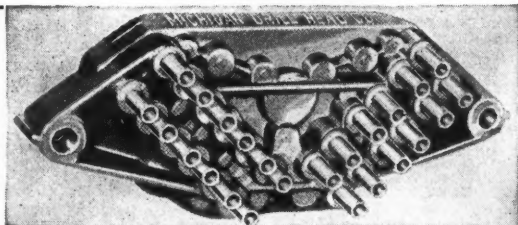
Greater Security

More and Better Homes

Pictured: a 24-Spindle Heavy-Duty Drill Head.

**DESIGNERS AND
MANUFACTURERS
OF MULTIPLE DRILL-
ING EQUIPMENT.**

We Invite Your Inquiry.



MICHIGAN DRILL HEAD CO. 971 E. 8-Mile Road, Hazel Park, Mich.



MAKING THE BIG CHIPS FLY!

**Sunoco Emulsifying Cutting Oil Is Used for
Rough-Finishing Heavy SAE 3140 Forgings**

The correct cutting fluid is a big factor in the continuous heavy-duty machining of tough steel forgings on the machine shown above.

Machine: Warner & Swasey 4-A Heavy-Duty Turret Lathe

Material: SAE 3140 Forging

Operation: Roughing-Out Cap for Pile-Driving Machine

Cutting Fluid: 1 part Sunoco Emulsifying Cutting Oil to 20 parts water

Sunoco Emulsifying Cutting Oil is a viscous, self-emulsifying oil that quickly and easily forms a stable emulsion with water. It contains no animal or vegetable fats, and will not turn rancid.

Sunoco Emulsifying Cutting Oil meets the demand not only of tough cutting jobs, but also of a wide range of turning, milling and grinding operations calling for close tolerances and fine finishes. It is particularly efficient where precision is demanded in high-speed machining.

For full information, and samples for testing in your machines, call your nearest Sun office, or write Department MM-10.

SUN OIL COMPANY • Philadelphia 3, Pa.

In Canada: Sun Oil Company, Ltd.

Toronto and Montreal

SUN PETROLEUM PRODUCTS

"JOB PROVED" IN EVERY INDUSTRY



Shorter Working Hours

But we ought to be able to do even better in the future than we have in the past—if we all work together to increase our productivity and to spread its benefits through increased wages, lower prices, shorter hours, more jobs, and better collective bargaining, as well as more income to owners. Only in this way can we hope to level off the ups and downs of prices and jobs, avoid depressions, reduce industrial disputes and enjoy the good things for all which our economic system can give us.

A Platform for Americans

The program of the Advertising Council's public-service campaign for a better understanding of our American economic system is based on the following 10-point platform. The points are . . . goals . . . which we have been able to realize in varying degrees.

This is a platform on which all Americans can stand. It has been enthusiastically endorsed by the Council's Public Policy Committee, whose present members represent all groups in our national life.

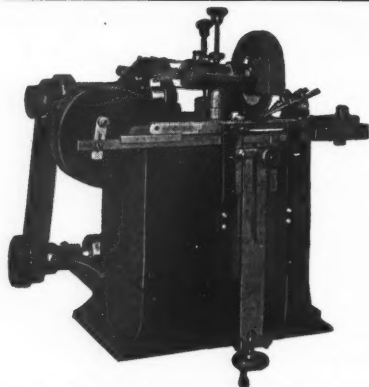
1. Freedom of the individual to work in the callings and localities of his choice.

2. Freedom of the individual to contract about his affairs.

3. Freedom of the individual owner of private property to start and manage an enterprise, to invent and profit thereby, to invest in a profit and loss system, to buy and sell in a free market—insofar as this freedom does not conflict with the public interest.

4. Freedom of the individual to speak, to inquire and to discuss.

5. Protection for the individual—by public or private means—against the basic hazards of existence over which he may have no control.



Wardwell Model EC Combination Grinder

The only single unit grinder adaptable for hack, band and circular saws that does not depend on the shape of the grinding wheel to form the shape of the tooth. • This unique feature enables operator to grind a variety of blades without dressing or changing wheels.

**if your metal saws
are replaced too frequently
LOOK TO YOUR SHARPENING
METHOD**

Temper toughness and cutting ability of metal cutting saws is affected by the care used in sharpening. When precisely ground, each tooth will take the maximum bite with minimum destructive effect on teeth. Proper sharpening of blades will pay for this grinder through savings of labor and material. Adaptable for circular, hack and band saws.

Write for Details

THE WARDWELL MANUFACTURING CO.
3166 Fulton Rd., Cleveland 9, Ohio



See for yourself how **CIMCOOL** covers 85% of all metal cutting operations

The picture gets brighter in more plants every week as Cimcool takes over 85% of all metal cutting operations — and does a *better* job. This new kind of cutting fluid replaces all water emulsions and all but a few highly compounded specialty oils. It proves itself by improving machine performance.

Cimcool is different — a *chemical emulsion* — that combines friction reduction and cooling capacity in a degree never before attained. It increases tool life, permits faster speeds. One test run will convince you!

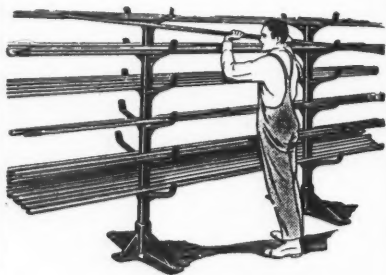
CIMCOOL DIVISION OF THE CINCINNATI MILLING MACHINE CO.,
CINCINNATI 9, OHIO, U. S. A.



CIMCOOL *for* **85%**



Each BROWN SECTIONAL RACK combines five major and several minor features of design, all of which save money for its owner. The time previously lost in end-hauling each bar of stock its entire length from the old-style, closed-side Rack is saved by the Brown Rack which requires but a few inches of side movement.



Each length, width and thickness of stock is displayed in Gold-Fish visibility for instant selection and workmen waiting for stock are served without waste of time. The BROWN SECTIONAL RACK is a simple, durable article built in five styles from standard inter-locking metal sections. It cannot burn, sag or twist; unattached to the building, it can be moved at will. Changes in length of stock can be met by moving the units nearer or further apart, while increases of stock can be met by simply adding more standard units. Built from metal thruout, depreciation is practically nil. SEND FOR BULLETIN 26-M.

BROWN SECTIONAL RACK

BROWN ENGINEERING CO.

120 N. THIRD ST. READING, PA.

RACKS • VISES • CLUTCHES • COUPLINGS

6. Government action in economic affairs, when necessary, to ensure national security or to undertake socially desirable projects when private interests prove inadequate to conduct them.

7. Freest possible competition consistent with the public welfare. We are opposed to unregulated monopolies of any kind.

8. Free collective bargaining — the right of labor to organize and to bargain collectively with employers.

9. Expanding productivity as a national necessity. American experience has proved that it is in the long-run interest of all: (a) to pay labor progressively higher wages in relation to prices; (b) to do this by progressively increasing productivity per man-hour through the application of constantly greater mechanization, power, efficiency and skill in the processes of production and distribution; and (c) to reduce hours of labor and improve real income while increasing the volume of production and distribution.

10. Increased recognition of human values as a prerequisite to better living. As a technological society develops, it inevitably produces a varying amount of industrial displacement and unemployment. While no solution of this problem has been found, the American people have sought to deal with it, not through a compulsory assignment of laid-off workers to other tasks but through such devices as unemployment insurance, employment services, vocational retraining, public works, community employment projects and family welfare programs. But much remains to be done.

(Special Permission granted by LOOK Magazine to print this article.)

**FREEDOM
IS
EVERYBODY'S JOB**



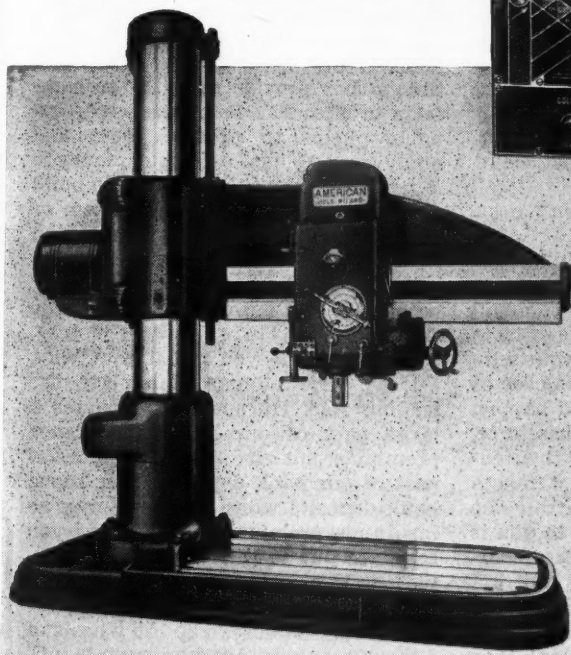
32

SPINDLE SPEEDS

Operators are enthusiastic in their praise of this new direct reading speed control. They don't have to refer to index plates or retain lever positions in their minds when making speed changes. Its superiority and convenience encourages operators to use correct speeds for their work. Being direct reading, operators are not fearful of making mistakes.

The entire range of 32 spindle speeds is secured through two opposed vertically operated

...with only
**2 Control Levers and
1 Back Gear Lever**



levers which are direct reading and one two-position back gear lever used only when changing from the high to the low speed range or vice versa.

This new speed control makes work easier; increases production because of it and the payroll dollar buys more as a consequence.

This and other fine features of the "American" Hole Wizard Radial Drill are thoroughly illustrated and described by Bulletin No. 326.

THE AMERICAN TOOL WORKS CO.

Cincinnati, Ohio, U. S. A.

Lathes and Radial Drills

Who's A Capitalist?

By JAMES C. STUART

Ketchum, MacLeod & Grove, Inc.

A. Who's a capitalist?

B. You are!

A. Don't be funny. I'm no more a capitalist than you are, and you know it.

B. But, I am a capitalist.

A. Now listen, Jim, I've known you a long time. We work together. We live in the same neighborhood and belong to the same union. Don't try to hand me that stuff. You're just a common ordinary working man, the same as me.

B. Sure, I'm just a working man, and I'll probably always be a working man. But that doesn't prevent me from being a capitalist. I still insist we're capitalists.

A. Are you nuts? You don't even talk sense.

B. That's what you think. But strange as it may seem to you, I am talking sense. Good sound common sense. Look—you're married and have two kids. You think a lot of your wife and kiddos, so in order to take care of them in case anything should happen to you, you took out life insurance. You're building an estate for their future. Or maybe you only carry enough to provide for your own funeral. The point I'm trying to put over to you is that you're saving money. The insurance company has made a contract with you in exchange for a certain amount of money you pay them at regular intervals. What do you think they do with that money—put it into a safe deposit box.

A. Don't be silly. Everybody knows

they invest it in stocks and bonds, mortgages and real estate.

B. Certainly, they invest it. They are investors of your money and mine. And through these investments, many industrial corporations get money for new plants and machinery. Railroads buy rolling stock. Public utility companies build power plants. Cities and states build highways, schools, sewage disposal plants, water purification plants, dams, bridges and all kinds of things that provide us with the comforts of life. The insurance company money helps to provide these and many more things. And your money is a part of it. So you're helping to build and maintain our economic system or social order, whatever you care to call it.

A. I never thought of it in that way before. It just never occurred to me that even I play a part in this picture.

B. A part! If you put it that way, I'd say Mr. Common Man plays the leading role. He not only provides a large part of our annual insurance premiums, but also a very substantial part of our bank deposits. You know, bank deposits work the same way as insurance premiums. The dollars you save are put to work with other people's dollars, either loaned or invested. Very similar uses are made of your money and mine to keep the wheels of industry moving. Who knows? Maybe your money helped buy that new streamlined train the railroad just put on—or that new mill that rolls out

steel strip at a mile a minute—or maybe that high school that we just opened last fall. Who knows? Yes, we're both capitalists.

A. But say—we're not the only ones then. There must be millions of them.

B. You said it, fellow. I just read the other day that in the United States there are over 45 million bank depositors and more than 73 million individuals insured. Altogether they provide a heap of money each year for our banks and insurance companies to invest.

A. You know, it sure must be one heck of a job handling so much money and making certain of the soundness of the investment.

B. Yes, and just think—it's all the tougher for the one who makes the decisions when he realizes it is not his own money he's investing. I don't think I'd want the job.

A. Me, either. I'll be content to keep

on being a common man and let the bank and insurance companies do their own work.

B. You said something there. It takes all kinds of people in all kinds of work to keep this world of ours moving along. And each must cooperate and have confidence in the other.

A. Thanks, pal, for putting me straight. The next guy that starts ranting against capitalism is certainly going to hear from me, for now I know if he's against our system, he's against me, too.

(Special permission granted by **PRINTERS' INK** to publish this article)

IN the first seven months of 1948, production approximated 2,980,000 vehicles—2,150,000 passenger cars and 830,000 trucks. In unit output, this put the industry about 215,000 vehicles ahead of their showing for the corresponding period of 1947.

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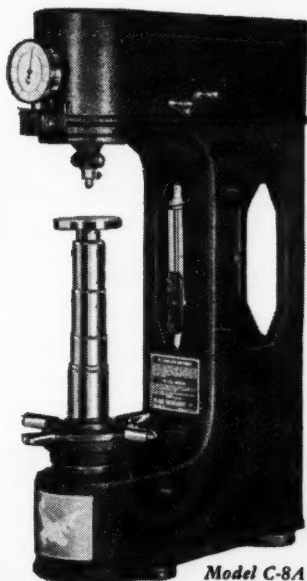
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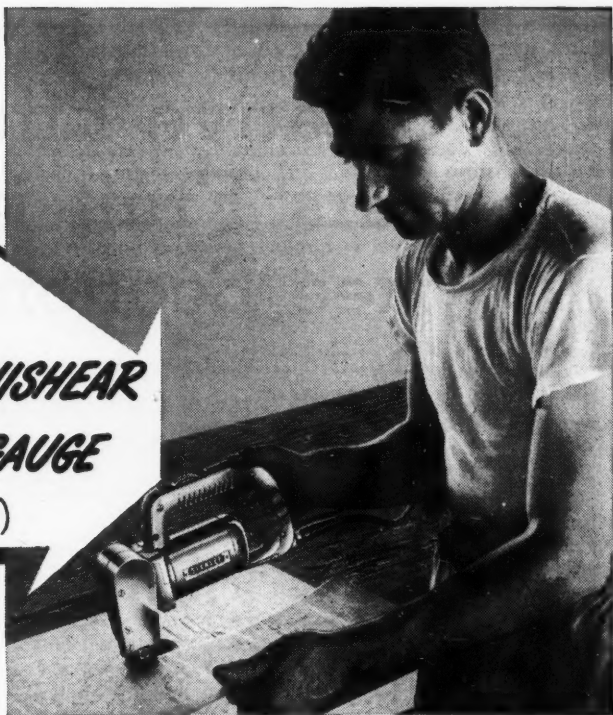
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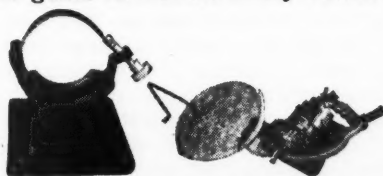
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R. G. LeTourneau

R. G. LeTourneau, Inc.

IF a successful enterprise is the "lengthened shadow of one man" the typical American business known as R. G. LeTourneau, Inc., is the lengthened shadow of its founder—R. G. Le-

Tourneau. Born November 30, 1888, on a farm in Richford, Vt., Robert Gil-mour LeTourneau was one of eight children of Caleb and Elizabeth Le-Tourneau. He left school at the age of 14 to become an iron molder's apprentice, supplementing his apprentice training with correspondence courses in mathematics and engineering. As he grew older he experimented with racing cars, developed skill in welding with the oxyacetylene torch, and operated a garage repair shop with a partner for ten years.

During World War I Mr. LeTourneau served as a machinist at Mare Island Navy Yard. Returning to his repair shop after the war he found his business in debt some \$5,000. In order to pay his creditors he took a farm leveling job for which he outfitted himself with a power tractor and scraper. Not satisfied with the operation of the machine, he turned to his welding experience and built a new scraper of revolutionary design. This was the pioneer job on earth moving equipment that was to later credit LeTourneau with over 150 patents in the earth moving field. It was also the embryo of the LeTourneau industry and the creation of the first machine of its kind with which one man can dig, load, haul and spread material in one complete cycle of motion.

In this year, 1920, LeTourneau found that welded structures of steel were lighter, stronger, simpler to machine and less expensive to build and operate than the riveted ones which the construction market offered at that time.

He also found that with such equipment he could reduce the cost of removing dirt for highways, building sites, dams and other forms of excavations more than 50 per cent. It was the building of this first scraper that led Mr. LeTourneau into the manufacturing field. From that time on he sold personally designed scrapers as fast as he could build them in his garage repair shop. His business grew so rap-

idly that ten years later he built an all-steel welded plant in Stockton, California, and incorporated the firm of R. G. LeTourneau, Inc., for \$100,000.

Typical of most new businesses, his firm had many financial ups and downs, but within a short time he had designed a new scraper unit with pneumatic tires—another “first” in the earth moving industry. He also introduced the first power control unit with which huge machines are enabled to operate their dig-load-haul-spread cycle successfully. By 1934 LeTourneau sales had grown to nearly a million dollars, and realizing the need for more central distribution and more access-

ible contracts for steel to make his machines he moved his plant to Peoria, Illinois. In 1944 the total sales of the LeTourneau Corporation were over \$42,000,000—a far cry from the \$100,000 plant built in 1920.

As the LeTourneau interests grew and expanded, a branch plant was built in Toccoa, Georgia, in 1938. This year also saw the development of the “Tournapull”—a two-wheeled, high-



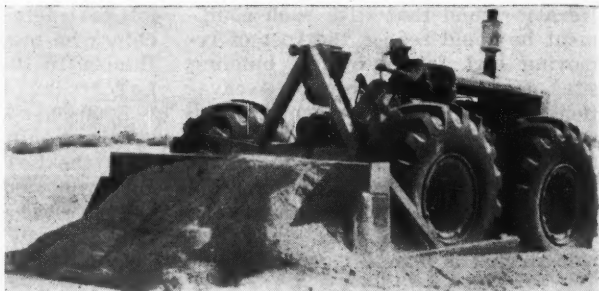
Fig. 1—Aerial view of the plant of R. G. LeTourneau, Inc., at Peoria, Illinois.

speed, rubber-tired tractor. The use of rubber tires made it possible to drive these heavy machines over paved roads—another “first.”

Another plant at Vicksburg, Mississippi, was begun in 1942 with the purchase of 9,000 acres of land. The war was now well under way and early in 1942 LeTourneau got priority on machinery to build shells for the government. This constituted a third site for LeTourneau operations. In Mississippi Mr. LeTourneau established a welding school for Negro cotton-field hands and rivermen. These men later built cranes for the Army and Navy and other LeTourneau wartime products.

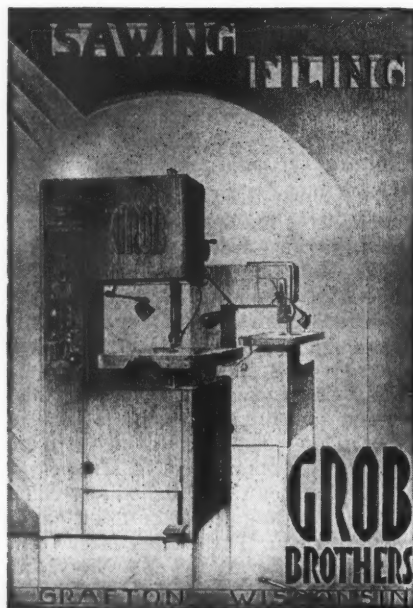
October, 1948

Fig. 3—Tornado dozer moving sand and mica silt for construction of a vineyard near Indio, California.



As a result of experiments in clearing forest land and milling lumber, a combination tractor-saw was developed which fells a 30-foot tree in five seconds. A 200,000 lb. capacity wood wagon for hauling trees was another innovation, followed by a 300-foot crane for lifting steel from river barges.

In the summer of 1941 LeTourneau joined with an Australian engineer on a 75-25 per cent basis to build a plant in New South Wales, Australia, to be known to LeTourneau (Aust.) Pty., Ltd. This subsidiary supplies New Zealand, Dutch East Indies and India.



Early in 1945 LeTourneau took over a building which had been used as a general hospital for Army veterans at Longview, Texas, and founded an accredited school to foster his theory of "learning while earning." The new institution was called the LeTourneau Technical Institute of Texas, the primary objective of which is to provide practical training for modern mechanics, technicians, and skilled craftsmen. An anti-climax to the founding of LeTourneau Tech was the development of the Tournalayer — "a machine that lays a concrete home within 24 hours." In addition to work for its plant employees, LeTourneau furnishes a career for heavy earth moving and lifting equipment dealers in every state in the Union, Canada, Central and South America and overseas. Thus the little garage repair shop in Stockton, California, gave to American industry a man who has become a national figure in engineering fields.

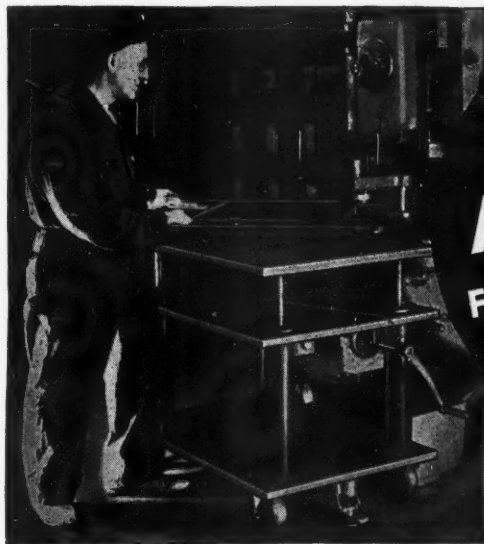
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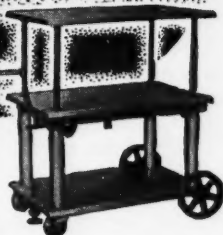
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N. A. Woodworth

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DURING the late, sloshy winter of 1940, a group of Ferndale City officials stood uncomfortably in a vast swampy field and listened skeptically

to a clear-eyed energetic figure paint word pictures about a great industrial plant to be built on the unseemly land.

There was a swamp to be drained, roads to be built, increased transportation for employees, greater home facilities for men and women workers and other necessary developments to establish a manufacturing concern. During the months to come these same officials watched incredulously as this industrial plant expanded from 25 employees to 50, to 1000, to 2000, to 4000, and finally 6000 men and women producing precision aircraft engine parts.

This newcomer to Ferndale was N. A. Woodworth—no newcomer to industry. A veteran of some 37 years in the manufacturing field, Newton A. Woodworth had a wide experience in industry before he formed his own company. Born in Ft. Wayne, Indiana, he was graduated in Engineering from Ohio Northern University. He was later a machine shop foreman with the General Motors Truck Corporation, a department head with Hudson Motor Car Company, and assistant superintendent of the Small Tools Department in the plant of the Ford Motor Company. While with Ford he established and managed the Aircraft Division which was an important industry during the first World War. A strong believer in teamwork, Woodworth had his first taste of the necessity of training new workers in the technique of machine production during World War I while he was with the Ford

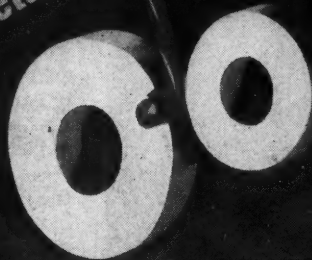


View of N. A. Woodworth plant, Ferndale, Michigan.

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Motor Company. The ideas which he conceived then have remained with him through the intervening years and contributed no little to the success of both the Ex-Cell-O Corporation and his own company.

After the end of the first World War Woodworth became a salesman for Ex-Cell-O Manufacturing Company, which was then a small shop in Detroit manufacturing a newly developed high-speed grinding spindle. Under the inspiration of his driving force the small shop soon outgrew its quarters and was forced to take larger space in a more modern building. As a result of his engineering ability, practical knowledge of machining and manufacturing operations and salesmanship ability, Woodworth became the head of the firm, which was then incorporated. As President of the Ex-Cell-O Corporation Woodworth's ability as an organizer soon made itself manifest and in rapid succession the corporation built a huge new plant for the

parent company and acquired several additional plants.

In 1937, at the height of his success as President of a great corporation employing many thousands of people and manufacturing a wide variety of precision machine tools, small tools and mechanical parts, Woodworth retired. In 1939, restless and eager to get back into harness, Woodworth began his plans for the new plant to be erected in Ferndale.

During World War II the N. A. Woodworth Company became the largest producer for precision aircraft engine parts for the Wright Aeronautical Corporation and its licensees. During this period his company introduced with great success and is continuing to manufacture precision fixed limit gages, adjustable gages, thread ring gages, patent cone-lok jigs, diaphragm chucks, special precision tools and precision machine parts. The company pioneered and developed new products and material which have contributed to increased operating efficiency and lower manufacturing costs, such as gages of cast Stellite alloy, the Limitrol, which is a comparator type snap gage, and a special processed alloy known as Navilide.

Keeping with him the key men who helped to blaze the trail for the Woodworth Company's amazing war production record, Woodworth is presently concentrating his plant facilities on the manufacture of these precision gages, jigs and diaphragm chucks. Here, again, is the story of a dream, the fulfillment of which is only possible in an atmosphere of freedom—a dream which in this case found its fulfillment in the building of industries which have afforded employment to thousands of skilled workers and which has contributed immeasurably to America's wealth in the form of millions of highly engineered precision parts and thousands of precision machines and tools for the production of other fine commodities.

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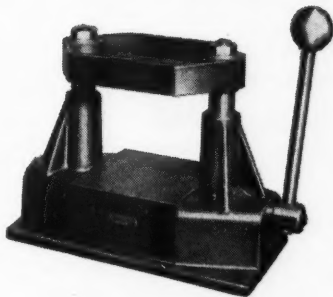


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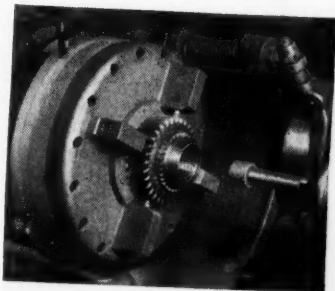


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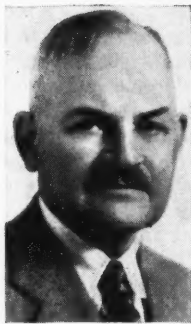
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Fred L. Maytag II
President, the Maytag
Company

The Maytag Company



Fred L. Maytag
Founder of the Maytag Company

THE Maytag Company was founded in 1893 by the late Fred L. Maytag and three associates, whose assets were, according to their own statement, "four ambitious men, a workable idea, \$2,400 in capital and an abundant fund of confidence in the future of America."

Fred L. Maytag, as a farm youth of 16, was placed in charge of a threshing outfit which he operated for a number of years. He took his turn at feeding the bundles into the threshers and along with the others ran the risk of having his hands lacerated by a careless or inexperienced band cutter. Thus he realized the importance of a device that would eliminate this hazard. Some time later while engaged in the lumber business in Newton, Iowa, he assisted G. W. Parsons in the first test of a band cutter and self feeder attachment for threshing machines, and in February, 1893, the Parsons Band Cutter and Self Feeder Company was incorporated with a capital of \$2,400. The four men who comprised the firm had at last solved the problem upon which threshing machine manufacturers had spent tens of thousands of dollars and had failed. Within a few years the Parsons Band Cutter and Self Feeder was used on threshing machines built by 28 different concerns.

As the years went on the company developed a corn husker and shredder,

an improved self feeder, and other farm accessories. In 1909 the name of the concern was changed to the name of the man who headed it; thus it became

the Maytag Company. In the two years previous to 1909 the company had been experimenting with a mechanical clothes washing machine. The first machine was operated by means of a rotary handle attached to a fly-wheel, and the next year a pulley mechanism was added so that the washer could be operated by a belt from an engine. In 1911 the electric motor was applied to the washer, making it possible for the home-maker to attend to other tasks while the machine did the laundry chore. For farm homes not equipped with electricity, a $\frac{1}{2}$ H.P. gasoline engine was designed which operated the washer in the same manner as the electric motor. The Maytag washer with the gasoline engine for power has been sold to more than one million users.

From that time on up to the present day Maytag washers have been improved at every opportunity and the Maytag line has been expanded to include many other power-operated household conveniences.

Fred L. Maytag passed on in 1937, but the policies and principles established by the founder for the conduct and operation of this company are still maintained by the present company President—Fred L. Maytag II. As a

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FEATURE

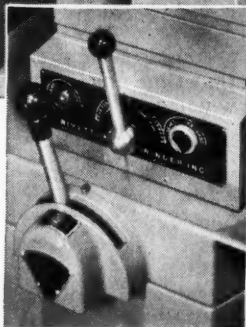
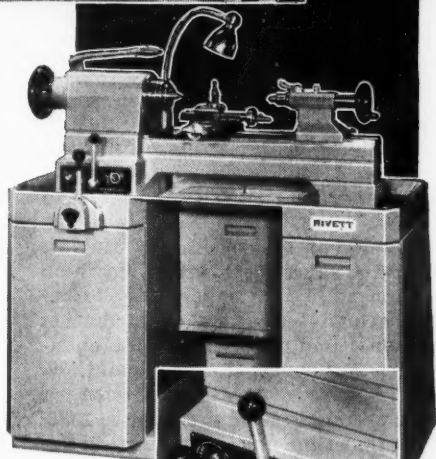
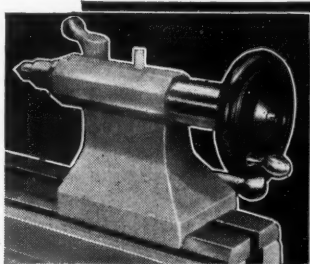
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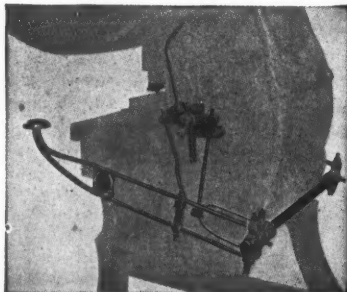


Aerial view of the Maytag factory, Newton, Iowa. The plant contains 800,000 sq. ft. of floor space and employs 2,500 people. The capacity of the plant is approximately 2,000 machines per day.

boy of 16, young Fred worked during the summers in the Maytag Company shops as a machine operator on the various jobs. In the fall of 1934, some months after graduating from the University of Wisconsin, Mr. Maytag joined the sales organization, in which position he had an opportunity to become acquainted with the distribution personnel and problems of merchandising. Returning to the plant he shortly took over the direction of sales, becoming vice president in 1936. From that time until he became President, which was in October 1940, he spent half his time in the office and

the other half out in the field. Under the direction of this third generation representative of the Maytag family, an excellent organization spirit has been developed in the Maytag plants. Mr. Maytag, the other officers of the company, and the members of the shop organization are all neighbors, and the plant workers realize that they can prosper only as their company prospers.

The story of the Maytag Company is another story of a man with a dream; a man who had the vision and was willing to make the effort to see his dream come true.



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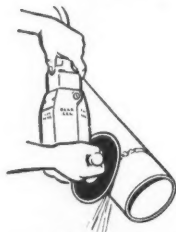
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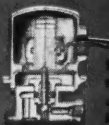
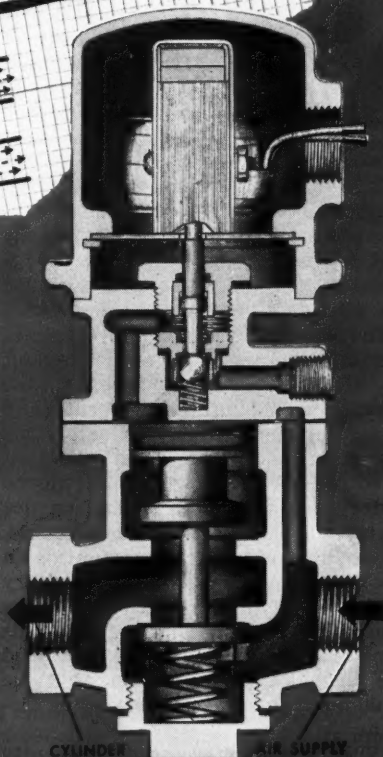
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Designed and built to stand up, seals are Mycar, other parts naval brass and stainless steel. Created specifically for efficient air operated control, straightway and 3-way, normally open or closed, 1/4" to 3/4" FULL FLO pipe capacity. As a dependable answer to your valve problems, Ross offers this latest addition to a line of over 500 quality valves designed for every phase of air control. Write for details and name of Ross representative in your area.



Solenoid-Pilot Sections interchangeable on all 16 Ross-In-Line Bodies.

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Glenn L. Martin

Glenn L. Martin Company

IN 1892 a six-year-old boy in the little town of Liberal, Kansas, learned how to build and fly box kites more successfully than any other boy in the neighborhood. What's more, he discovered a market for them and began his first production line on the floor of his mother's kitchen. The charge was 25c per kite.

The six-year-old boy was Glenn L. Martin. From that time on throughout his lifetime there was never a time when he wasn't interested in sails and lifting surfaces. He fitted a sail to his toy wagon, and in the wintertime fashioned a sail with which he moved faster and with less effort on ice skates when the wind was favorable. He also did some delicate navigation on his bicycle with a sail for auxiliary power. All of this experience with the vagaries of the wind crystallized in his mind in later years when he developed the unshakable conviction that he could build and fly a man-carrying airplane.

When the Martin family presently moved to Salina, Kansas, the boy worked in a bicycle shop while attending high school and while taking a two-year business course in a local college he promoted himself a job as a garage hand with the first automobile business to open in that town. In 1905 the family moved to Santa Ana, California, where Glenn started a garage of his own. It was about this time that he read of Orville Wright's flight at Kitty Hawk, North Carolina.

The first steps in the direction of realization of his desire to fly consisted in building a biplane glider which he practiced gliding from the hills near Santa Ana. But only after he felt completely at ease in his giant kite did he rent an abandoned church and begin construction of a biplane with a motor and a propeller.

There were no textbooks for reference; no blueprints or past experience to guide him. Everything he did was experimental. Working during the day as an automobile salesman and repairman, he labored at night on his airplane, aided by light from a kerosene lamp held by his mother, who had complete faith in his objectives from the start.

After two years of work at a cost of more than \$2,000, Glenn Martin's first aircraft was ready for flight. Finally in August 1909 he made his first flight covering 100 feet at a two-foot altitude. Little by little he increased the altitude of his hops until he reached 15 feet and stretched the distance flown to 100 yards. Not until the summer of 1910 did young Martin begin to feel satisfied with his plane and in November of that same year his first advertised exhibition flight took place at Santa Ana. Newspaper accounts of the flight attracted large crowds to Santa Ana, the plane was put on exhibition, tickets were sold and several hundred dollars were raised, which Martin used as a nest egg toward building his second plane. The next year he and his aircraft were in great demand at county fairs and local celebrations.

By 1911 Glenn L. Martin became one of the best-known fliers of the entire

country through his barnstorming throughout the west. He was the first to deliver mail by plane; first to deliver newspapers by plane; he bombed a sham fort by plane; used his flying machine to hunt coyotes, to hunt escaped convicts, to pick up a passenger from a boat, to search the ocean for lost aviators, and first to take motion pictures from a plane. In 1912, at an international meet in Chicago, he won

Martin aircraft were in such demand that it was forced to seek larger quarters. In 1929 Martin moved his business in its entirety to a 1,260 acre tract at Middle River, Maryland, which is 12 miles from Baltimore. Speaking before a civic gathering, Mr. Martin predicted that within a few years he would be utilizing the services of 10,000 employees. During World War II employment totals exceeded 50,000.



Plant of Glenn L. Martin Company at Middle River, Maryland. The plant covers 1,035 acres and has 2,725,000 sq. ft. of floor space.

more events than any other entrant and collected prize money amounting to \$4,854. That same year he moved his factory to Los Angeles and started a flying school in which many future leaders in aviation were trained.

Foreseeing the entrance of the United States into World War I, he merged his own interest with those of the Wrights in 1917 and formed the Wright-Martin Aircraft Corporation. However, the new organization was short-lived and with financial aid from a group of Cleveland capitalists, Martin again organized his own company. At the end of World War I Martin bought out his associates and became the sole owner of his business.

Under his administration the business flourished and in a few years

Under Martin's counselling, the company in recent years began research in other fields. As a result, a plant for the production of a vinyl type synthetic resin has been built at Painesville, Ohio. There a plant for the production of waterproof sheets made of cloth or paper sandwiched between and firmly bonded to thin sheets of aluminum, stainless steel, wood veneer or plastic has been constructed. Today the Glenn L. Martin Company is launched on a program of passenger and cargo plane construction. Today many of Martin's greatest competitors are some of his old employees. Glenn Martin, himself, is one of the few pioneer fliers of America who is guiding the destinies of his own company.

The Story of the Freuhauf Trailer Company



Top—Main offices and Detroit plant of Freuhauf Trailer Company
Center—Harvey F. Freuhauf
Bottom—The blacksmith shop in which the first Freuhauf trailer was built.

FROM a little blacksmith shop on a side street employing seven people, to a huge corporation with nine factories and nearly 100 branch outlets employing nearly 8,000 people, is an amazing story of growth in a little over 30 years. That is the story of the Freuhauf Trailer Company—the world's largest builder of truck trailers. Yet this story is no more amazing than is the story of the man behind the firm; the man who might be given a large share of credit for the growth of the entire motor transport industry—Harvey C. Freuhauf, founder and President of the company that bears his name.

Harvey Freuhauf's parents were pioneer Detroit stock. Harvey's father attained quite a local reputation as a skilled blacksmith and wagon maker and in his shop produced many of the wagons and carriages sported by some of early Detroit's leading citizens. But while Harvey was still a schoolboy the increasing popularity of the automobile sounded the doom of the horse and wagon. With the advent of the motor truck, the family's chief source of income began to shrink and while still in the ninth grade, Harvey left school to work in a foundry. However, he enrolled in night school and after working ten hours a day sat up half the night studying accounting. His wages at that point in his career were 10c an hour. A little later Harvey joined his father in the blacksmith shop.

It was about this time that a Detroit lumber dealer who had long been a customer of his father purchased a 1914 Model-T Ford and came to the shop to see if any way could be devised to convert his new roadster so that it

FOUR GOOD TOOLS

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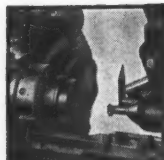
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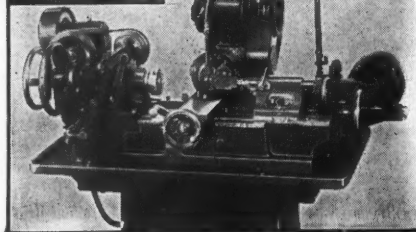
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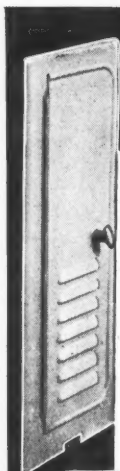
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could be used to carry lumber. That was when Harvey conceived the new application of an old fact—that a horse can pull more than it can carry. He interrupted the discussion between the older men with the question "Why not build a wagon that your roadster can pull like a horse?" That day was actually the birth date of the modern highway transport industry.

Other merchants, noting the advantage of the new truck wagon, came to Freuhauf and demanded that he build them units just like it to pull behind their automobiles. Harvey, aware of the trend to heavier hauling motor units, decided the time was right to open a shop devoted entirely to the manufacture of these new truck wagons.

In 1916 the Freuhauf Trailer Company was formed and began advertising its custom-built trailers, and in 1918 the company was incorporated. Today, still a comparatively young man, Harvey C. Freuhauf heads an organization with an annual gross nearing one hundred million dollars. From the little blacksmith shop in which the company was started, the Freuhauf Trailer Company has grown to its present size with nine modern factories. Serving America's merchants and industries, here is a great organization which is, in truth, the "lengthened shadow of one man."

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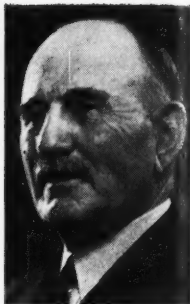
ALLIED PRODUCTS CORPORATION

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George W. Mason

Nash-Kelvinator Corporation



Charles W. Nash

TWELVE-year-old Charles Nash skipped church on Sunday, July 5, 1874. That was the day he had chosen to

run away. When Farmer Lapworth, to whom the boy had been "bound out" since he was six years old, stood beside the family carriage calling him, Charles was hiding in the woods. He watched the carriage disappear down the road, then ran into the house to collect his handful of belongings. Not many men have achieved success with a more difficult beginning than Charles William Nash.

After walking 15 miles Charles stopped at a farm near Grand Blanc, Michigan, where he obtained a job at \$8.00 a month. Three months later he obtained a better job at another farm at \$12.00 a month and while still working on the farm he learned the carpentry trade from a local mechanic. At the age of 18 he received his first mechanical training while operating a portable steam hay presser.

By 1890 Mr. Nash had acquired a wife and in that year the couple moved to Flint where he obtained a job with the firm which later became the Durant-Dort Carriage Company. Within six months Nash was superintendent of the plant.

In 1904 Nash joined with David L. Buick to acquire the old Imperial Wheel Works at Jackson, Michigan, and went into the business of building automobiles. The business was later moved back to Flint and in 1910, upon the organization of the General Motors

Company, Nash was appointed President of Buick Motor Company. Within two years after entering the automobile business Nash headed not only Buick but also the Oakland Motor Company, Olds Motor Works and General Motors Truck Company, and in November, 1912, was elected President of General Motors Corporation.

In 1916 Nash resigned as President of General Motors to go into the automobile business for himself. He bought the stock, assets and business of the Thomas B. Jeffery Company, Kenosha, Wisconsin, and in the fall of 1917 the first Nash-designed car appeared on the market. In 1918 Nash became the largest producer of trucks in the world, building 11,490 of the famous Nash four-wheel-drive Quads for the U. S. Army. Subsequently Nash purchased a half interest in the Seaman Body Corporation of Milwaukee and purchased the LaFayette Motors Corporation trade name and business which he merged with the Nash Company. In 1925 Nash added to his plant facilities by purchasing the plant of the defunct Mitchell Motor Car Company of Racine, Wisconsin.

In 1936, at the age of 72, seeking strong leadership for his business, he asked George W. Mason to become President of Nash Motors. Being President of the Kelvinator Corporation, Mason declined, but negotiations finally resulted in the merger of Nash and Kelvinator.

George W. Mason saw his first mo-

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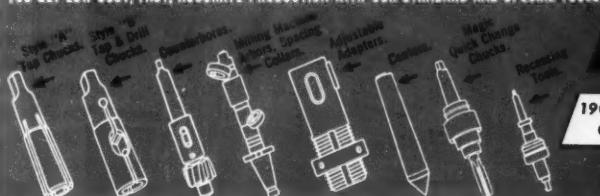
Equip your machines now with these Scully-Jones Centers that will meet all your requirements: (1) Tungsten Carbide Tipped Centers (2) Stellite Tipped Centers (3) Solid High-Speed Steel, Plain and Half Centers (4) Carbon Steel Centers (5) Special Centers made to your requirements. Furnished with Morse, Jarno or Brown & Sharpe Tapers in all popular sizes.

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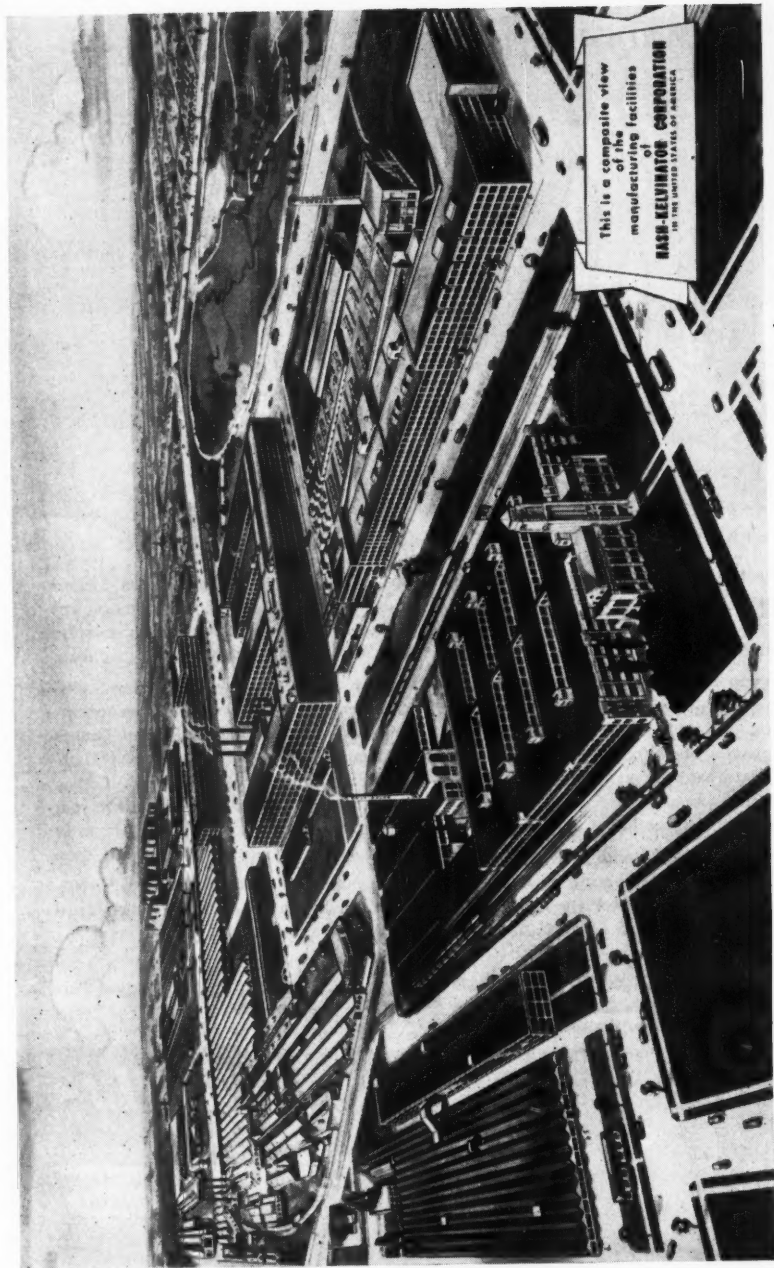


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Adjustable Type
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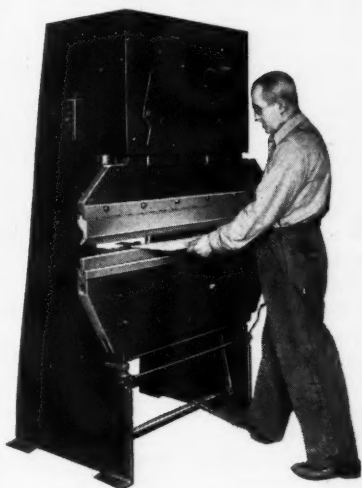
Composite view of manufacturing facilities of Nash-Kelvinator Corporation. Center foreground, Detroit plant and main offices. Upper left, Nash-Kelvinator Plant. Lower left, Nash-Milwaukee Parts Depot. Upper center, Nash-Milwaukee Body Plant. Upper right, Nash-Racine Proving Ground. Lower right, Nash-Kelvinator Grand Rapids Plant.

tor car in 1904 on the streets of Valley City, North Dakota, where he was born March 12, 1891. From that time on everything pertaining to automobiles and motorcycles interested him so greatly that he became a helper to the mechanic at the local garage after school without pay. Later he was given a full-time job working in the shop in the forenoon and spending the afternoon of each day demonstrating cars to prospective buyers and teaching new owners how to drive. In 1909 Mason entered the University of Michigan and while in college he operated a distributorship for the Briggs-Detroit automobile. During this time he met W. R. Wilson, then assistant to the general manager of the Studebaker Company, and when he finished college Wilson hired him. In 1914 Wilson became associated with the Dodge Brothers Company, where Mason later joined him and acquired the production and purchasing experience which was invaluable to him in later years.

During World War I Mason supervised production of many items of material for the Army Ordnance Department and in 1921 Wilson again summoned him into the automobile industry, this time as his assistant in the Maxwell organization which was then being reorganized by the late Walter P. Chrysler. In 1924, when the Chrysler Corporation was formed to succeed Maxwell, Mason became works manager. Two years later, when mechanical household refrigeration was developing in popularity, Mason left Chrysler to become vice president of Copeland Products, Inc., then a leading manufacturer in this field. Elected President of Copeland in 1927, he resigned in 1928 to become President of Kelvinator Corporation—and he was still only 38 years old. In 1936 Charles W. Nash offered Mason the presidency of Nash Motors, which opened negotiations which finally resulted in the merger of the Nash and Kelvinator

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Model No. 131



A new member of the Chicago Press Brake family designed to supplement the larger machines.

Within its rated capacity (11 tons) all operations are handled same as on the larger machines.

All steel construction, enclosed gearing.

Takes up small floor space.

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further description

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Companies discussed earlier in this story.

The careers of these two men—Charles W. Nash and George W. Mason—are typical of the successes that have been achieved by hundreds of Americans. Such successes are impossible in lands where one can work only

at the job that is allotted to him, where no man may leave his job to take another without the approval of government officials in some higher strata of existence, and where any person who moves from one place to another immediately becomes a suspicious character to the secret police.

WE, THE PEOPLE

A STORY told by Burnett Hershey, author and war correspondent, is making the rounds in Washington. Even collectivist-minded individuals admit it's good, although it razes the Soviet system. It goes this way:

An American labor delegation visited the Skoda works in Czechoslovakia. The Americans asked: "To whom does this factory belong?"

"We, the people, own it," said the guides.

"Who owns the machinery?" asked the Americans.

"We, the people, own it," the guides answered.

"Who gets the profits?" the visitors demanded.

"We, the people get them," was the reply.

Then the Americans saw three large cars parked nearby, and asked who owned them.

"One is owned by the commissar for defense, the second belongs to the chairman of the workers' committee, and the third to the representative from Moscow, who is visiting here," the guides told them.

Then a Skoda delegation arrived in America to tour industrial plants. An American labor leader showed them the Ford factory.

"Who owns this factory" the visitors asked.

"Mr. Ford does," said the American.


"Who owns the machinery?" they demanded, and were told Mr. Ford owned it.

"Who gets the profits?" the Skoda men continued.


"Mr. Ford does," said the American.

Then the visitors saw 30,000 cars parked in a nearby lot, and asked: "Who owns all those cars?"

The American grinned. Then he said: "We, the people, own those cars."

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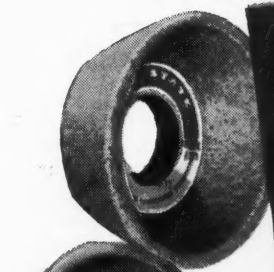
These BAY STATE abrasive products, with their large pore spaces, are giving an outstanding performance on countless SURFACING and TOOL and CUTTER JOBS that require extra coolness of cut, and fast, heavy removal of metal.

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Walter A. Geist

Allis-Chalmers Manufacturing Co.

FOR more than a century, men of vision and courage have contributed their talents toward making Allis - Chalmers a manufacturer of the most

diversified line of industrial equipment in the world. Growing with the nation, this giant producer of power generation, power distribution, power utilization equipment, and farm machinery was conceived by Edward P. Allis, an aggressive young man who came to Milwaukee in 1846 after graduating from Union College, Schenectady, N. Y., with a degree in law. Convinced of the potentialities of the 14-year-old French burr mill stone firm of Decker & Seville in the expanding Milwaukee milling center, Allis acquired the company in 1861.

The Edw. P. Allis & Co., Reliance Works, served as the springboard for Allis' policy of diverse manufacture—adding new products and services to meet the changing requirements of a wide range of industries. The policy is still being adhered to, and today the company produces 1,600 products in nine plants employing more than 33,000 persons.

At the time of Allis' death in 1899, in addition to sweeping developments in flour mill, saw mill and steam power machinery, Edw. P. Allis & Co. had designed and built hoisting engines for various Lake Superior copper mines, rolling mill engines for steel companies, blowing engines for blast furnaces and Bessemer converters;

had introduced the wrought iron frame for large engines, and made many other important contributions to industry and the nation.

By 1900, the reputation of The Edward P. Allis Company—the firm name selected following Allis' death—had become world wide, due in no small measure to the genius of Edwin Reynolds, who was internationally recognized as an outstanding engineer in the field of big Corliss engines and centrifugal pumping engines.

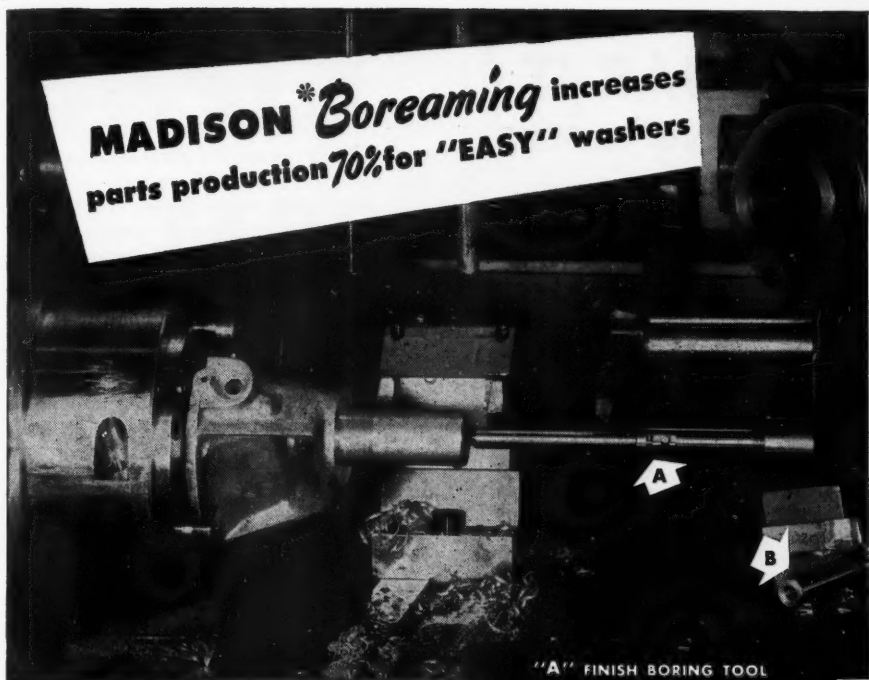
In May, 1901, merger of the Edward P. Allis Company, Fraser & Chalmers Co., Gates Iron Works, both of Chicago, and the Dickson Mfg. Co., Scranton, Pa., to form the Allis-Chalmers Company, contributed well established leadership in certain basic lines of machinery together with valuable designs, plant facilities and personnel.

As a result of this merger, Allis-Chalmers shaped up something like this:

Its annual business reached the \$10,000,000 mark. It employed 5,000 men in five plants. It had branch offices in ten leading American cities as well as offices in London, Mexico City, Johannesburg and Santiago abroad.

The years following the merger were years of experiment—intense development work—rapid expansion into new fields. They marked the acquisition of patent rights making Allis-Chalmers the sole licensee in the western hemisphere of hydraulic turbine developed by Escher-Wyss & Co., Zurich, Switzerland; sole rights in the western hemisphere to manufacture Nurnberg gas engines produced by the Nurnberg Machine Co., Nurnberg, Germany, and in 1904 Allis-Chalmers took over the

MADISON *Boreaming increases
parts production 70% for "EASY" washers



*Completed boring operation

Here's the story: An aluminum casting required the following operations on inside and outside diameters — Rough bore 1st ID — Rough bore 2nd ID — Finish 1st ID — Chamfer ID — Face Shoulder — Turn 1st OD — Turn 2nd OD — Finish 1st OD — Finish 2nd OD — Thread 2nd OD.

Using single point tools, all six of the turret faces were required to finish a single casting. 19.7 parts per hour were completed.

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"A" FINISH BORING TOOL



revolution. 33.6 parts per hour were completed.

Thus with two Madison tools Easy gained a production increase of 70.5%. Why not put Madison Boreaming to work for you?

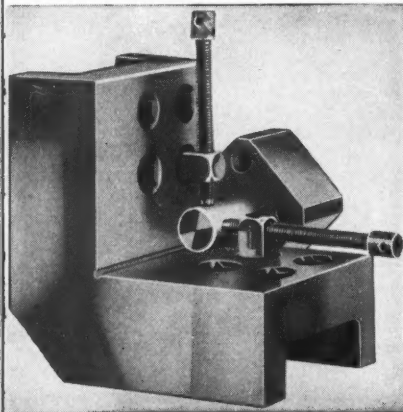
Write for the Madison Catalog today. Get the facts on Madison Boreamers, the tools that make one operation out of boring and super finish reaming.



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SQUAR-IT CLAMPING BLOCKS



Save costly set-ups in holding small work. All surfaces ground square with their opposite and right angle faces . . . to assure a perfect job on removal from block. Square sliding clamps are fitted to broached holes for easy removal. Furnished with two long and two short sliding clamps. Screws have knurled heads with hex broached hole in end for wrench tightening. Blocks furnished hard or soft . . . Model H-4 or S-4.

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**TALLMAN TOOL
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Bullock Electric Mfg. Co. of Cincinnati, O., and Montreal, Canada.

It was Gen. Otto H. Falk, who headed the reorganized Allis-Chalmers Mfg. Co. in April, 1913, who decided the company needed a product to make its name known to the public to provide the steady volume that can be obtained only by selling to hundreds of thousands of individual customers. After careful thought and study, agricultural equipment was decided upon. The first product was a tractor, which appeared in 1914.

Between 1928 and the present, Allis-Chalmers acquired eight companies to enable it to produce its present extensive line of tractors, farm and road machinery. Two of the greatest contributions to American agriculture in several decades were the adaption of rubber tires to farm tractors by Allis-Chalmers in 1932, and the introduction of the company's All-Crop Harvester in 1935. This was followed by the first rear engine tractor in 1948.

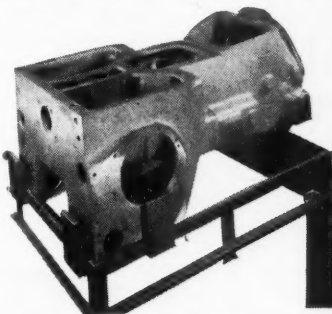
By 1917 Allis-Chalmers was making hundreds of different products, serving virtually every industry. A remarkable period of expansion in machinery lines started in 1924 with Allis-Chalmers acquiring five companies between that year and 1931. Its policy of diversification was drawing dividends. Its soundness was evidenced by the manner in which Allis-Chalmers weathered the 1929 depression.

In 1924, Allis-Chalmers made history in a new field with the introduction of the Torex V-belt drive. This application of V-belts in multiple was originated by Walter Geist, who became president of the company in 1942. His climb to the top is a typical American story.

Geist started with Allis-Chalmers as an errand boy in 1909. Being a member of a large family, he was obliged to quit school at the age of 16 and go to work. Displaying drive and initiative, he advanced from errand boy to

BESLY TAPS

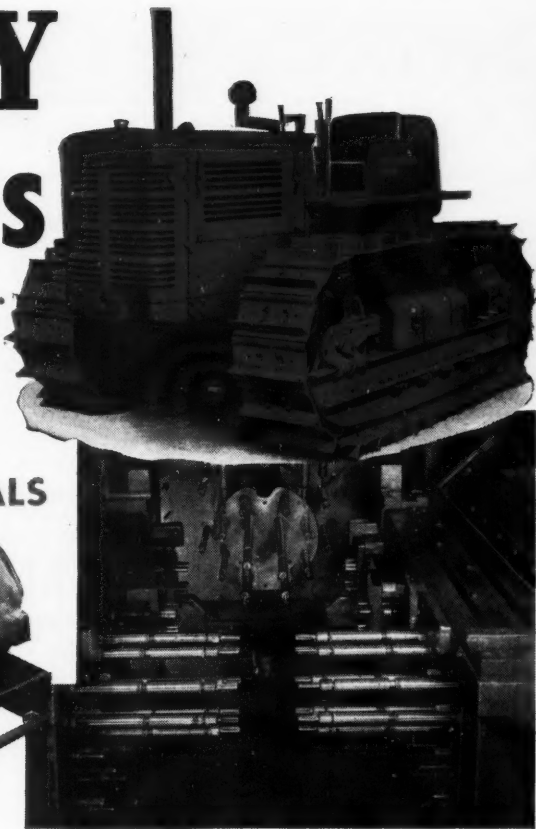
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This handy booklet offers useful information on taps and tapping procedures. It's written by shop men for shop men. Tap fits and drill sizes are listed in detail. Write today on your own letterhead for your copy—free.

Above: this rugged, one-piece frame casting is the "back-bone" of an International Tractor.

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For multiple tapping on tractor frames, this automatic machine, equipped with Besly high-speed taps, threads 89 holes in a single operation.

The International Harvester Company relies on Besly Taps for many threading operations in building its world-famous diesel tractors.

For more than 50 years—Besly Taps have proved their outstanding capacity for clean-cut, low-cost work. A list of Besly Tap users is a directory of well-known American manufacturers.

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BESLY

**BESLY TAPS • BESLY TITAN ABRASIVE WHEELS
BESLY GRINDERS AND ACCESSORIES**

tracer, draftsman and designer.

His ability did not go unrecognized. At the age of 31 he was made engineer in charge of transmission. This was excellent progress for a self-educated young man in a large engineering organization. But it proved to be a blind alley. He had gone as far as he could in that department.

This dilemma proved fortunate, for from it a \$30,000,000 idea was born. After two years of experimenting, Geist discovered the principle of the multiple V-belt drive, now known as the Texrope V-belt Drive. Following this development, Geist's progress in the company resumed at an accelerated pace. In 1933, he was made general representative of the firm's general machinery division in charge of its sales organization, after extensive traveling in connection with the marketing of his V-belt development. In 1939 he was named vice-president and

continued to supervise the marketing of the company's 1,600 general machinery products through 60 district offices. Before being appointed president by the board of directors in May, 1942, he served as executive vice-president for a short time.

Formal recognition of Geist's contribution to American industry came in 1940 when he was awarded the "Plaque of the Modern Pioneer." The award was made by a distinguished committee of scientists headed by Dr. Karl T. Compton, president of the Massachusetts Institute of Technology. In addition he has been awarded doctorates in law and engineering by Lawrence College, Appleton, Wis., and the Michigan College of Engineering and Technology at Houghton, Mich. Keenly interested in education, he is on the Board of Governors of Marquette University at Milwaukee and a trustee of St. Olaf College at Northfield, Minn.



FOR MAXIMUM ACCURACY
IN DRILLING HOLES

...it's the bushing that makes
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To maintain maximum accuracy in drilling operations, use the bushing that's precision made for the job . . . use Acme! Write for catalog.

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Acme Industrial Company
Makers of Hardened and Ground Precision Parts
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*Now a belt that speeds up
stock removal, and
lasts 2 to 4 times longer*

THE ~~NEW~~ RESINALL METALITE*

Here's a cloth backband belt that takes the high heat of fast stock removal, and gives 2 to 4 times the usual dry grinding mileage.

The answer is in the bond — a thermosetting resin that heat cannot weaken, combined with the Behr-Manning patented Durabonded* process which assures extra strength and grain-grip, and retards loading. This heat-proof bond locks every abrasive grain in its original, correct cutting position.

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GET A FREE DEMONSTRATION

See the new RESINALL METALITE belt do its stuff in your own shop on your own work. Just write us on your letterhead.

**THE BELT METHOD IS THE BETTER METHOD
... AND THE BETTER BELT IS METALITE**

Farrel-Birmingham Company, Inc.

THE Farrel Company had its beginning in 1848, when Almon Farrel and his son, Franklin, built a foundry and machine shop in what is now Ansonia, formerly part of the town of Derby, Connecticut. Almon Farrel was an expert millwright and had developed marked talent as an engineer. Franklin Farrel had begun his training with his father at the early age of fourteen. In 1847 Almon Farrel acquired a tract of land from Anson G. Phelps, plus "one-half square foot of permanent water" from the canal they had recently completed for Mr. Phelps. The following year a small shop was built to make brass and iron castings, wooden mortise gears and parts for water-power plants. The firm was known as Almon Farrel & Company.

In 1849, the same year that saw the opening of the Naugatuck Railroad from Bridgeport to Winsted, the name of the Farrel company was changed to Farrel, Johnson Co. This was succeeded in 1850 by another firm called Farrel Foundry. Associated with the Farrels in these partnerships were Richard M. Johnson, a patternmaker, and E. C. Lewis, a foundryman. Because of the need for quicker repair service in the Waterbury area, the company opened another foundry and machine shop in that city in 1851. This branch plant was taken over by its manager, E. C. Lewis, in 1880, becoming a separate corporation under the name of Waterbury Farrel Foundry & Machine Company.

In 1857, shortly after Almon Farrel's death, the company was incorporated as Farrel Foundry & Machine Co. Franklin Farrel, who had been associated with the firm since its found-

ing, became President in 1869, and continued as head of the company until his death in 1912.

In supplying the needs of growing New England industry, the new company met its early opportunities. The firm specialized in heavy castings and in the manufacture of rolling mill equipment for the rapidly expanding copper and brass industries. It also pioneered in the development of processing machinery for the rubber industry, which was commencing its important growth following the discovery of vulcanization by Charles Goodyear in nearby Naugatuck in 1839.

The Farrel plant also entered into the manufacture of equipment for other industries which were fast gaining ground in the western hemisphere. One was the paper industry, for which rolls and calenders have been made at Ansonia for over three-quarters of a century; another the cane sugar industry, which at this time was attaining a foothold in the West Indies. Farrel began the manufacture of cane mill equipment in 1870. As early as 1890, two large mills, weighing 320 tons each, were shipped to Cuba.

Stone and ore crushers, starting about 1875, also became important items of production, and by the turn of the century thousands of these sturdily constructed and durable units had found ready acceptance in the growing mining industry and the expanding fields of building and road construction. About 1885 chilled iron rolls were introduced into the grain industry, where they rapidly replaced stones formerly used for milling flour. This added another important industry to the list of Farrel roll users. Still



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DThe railroad engineer is a specialist, trained by years of apprenticeship to accept one outstanding qualification — that of personal responsibility. The Bath organization recognizes its responsibility to industry by maintaining high standards of quality throughout the step-by-step production of ground thread taps.

DThe selection of steel, the grinding of threads from the solid AFTER hardening, the accurate adherence to specifications and a rigid system of inspection, guarantee the uniform quality of Bath stock and the uniform quality of Bath stock and special size ground thread taps. Years of apprenticeship have produced experienced Bath craftsmen, ready to help with your tap problems. We invite your inquiry—see your Bath representative or write us direct.

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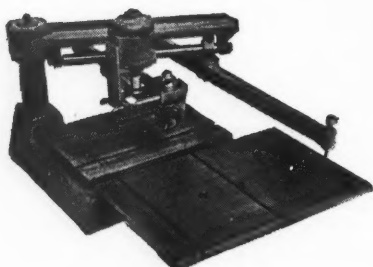
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**20 Grafton Street
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MODEL CC 3D

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Model PE-1

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Model PE-1. Engraves an area 5 by 5 inches on curved surfaces without special templates, with smooth lines in any design, number, letter; on iron, brass, copper, aluminum, soft steels and all plastics. • Drills a series of holes • Profiles small parts • Increases accuracy and production • Works from original drawing or templates • Etches glass and similar items • Will not cause distortion. For information and prices write Dept. M.

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1776 Broadway New York 19, N. Y.

another successful undertaking was the early development of machines for grinding rolls to higher standards of accuracy and finish.

In 1920 the company acquired another plant in Buffalo to take care of increased demand for its products and to specialize in the manufacture of gears, gear drives and gear generating machines. With this new phase of the Farrel business came the acquisition of American rights to the important Sykes gear generating process.

Along an Adjacent Path

In 1836, twelve years before the Farrels started their plant in Ansonia, two brothers, Sylvester and Sullivan M. Colburn, came to the town now known as Derby, Connecticut, and started a small foundry. Later they were joined by another brother, Dr. Josiah M. Colburn.

This enterprise, which nearly a century later became an important part of Farrel-Birmingham, was called Birmingham Iron Foundry, since in these early days, the town was called Birmingham.

In 1850, the firm became a corporation, one of the first eight businesses to be incorporated under the laws of the State of Connecticut. At that time, a machine shop was added. The company was the first in Connecticut and one of the first in the United States to manufacture chilled iron rolls, which, until this period, had to be imported from England. When the corporation was formed, Sheldon Bassett came into control and headed the company as President until his death in 1864, when he was succeeded by his son, Royal M. Bassett.

The company continued under the management of Royal M. Bassett and his brother, Theodore S., until 1891, when Henry F. Wanning, who had been associated with the company since 1865, became its President. His

Immediate shipments from stock of U·S·S Carillo Steel

— manufactured to a
**Guaranteed Minimum
Hardenability**

If you are a user of alloy steel, it is to your advantage to know that U·S·S Carillo Steels in our stock are manufactured to a *Guaranteed Minimum Hardenability*.

And when you place an order with us for U·S·S Carillo Steel you get an additional metallurgical service: A *Heat Treatment Guide* which contains complete and specific information about the steel you receive is supplied you with each individual shipment. This guide gives you specific data on the composition, potential physical properties and fabrication of the steel to help you obtain the maximum performance from the steel we furnish on your order.

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* VAC-IT

does all your cleaning
JOBS



The durable Doyle Vac-It is constructed to handle any cleaning job in your plant efficiently and without the necessity of changing parts. Wet and dry cleaning jobs are all the same to the Vac-It. Dirt and dust are removed from plant and office floors and walls . . . overhead pipes, production line machinery and installations are quickly cleaned and kept free from clogging dirt and metal scraps with the Doyle Vac-It and Doyle equipment. The Vac-It does not push dirt around . . . it picks it up and removes it from the plant.

The powerful suction of the Vac-It also recovers lubricants, coolants or water at the rate of 720 gallons per hour.

Vac-It will make all your cleaning jobs easier, faster and less costly.



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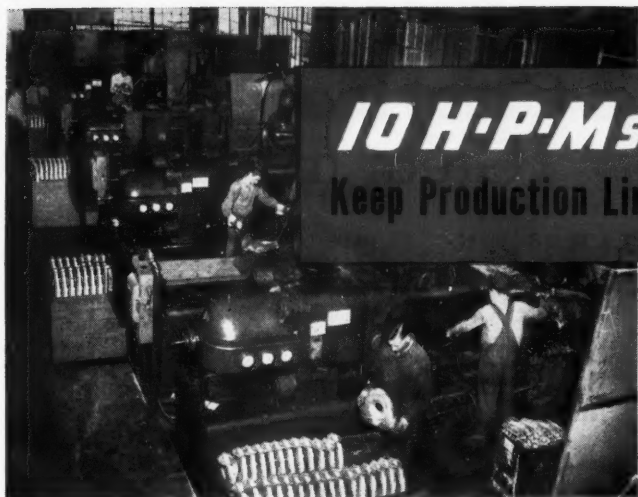
3225 Stevens St., S. W.
Grand Rapids 7, Michigan

son, Francis D. Wanning, joined the company in 1894, and during the years that followed played an important part in its management, serving as Vice-President for many years until the merger with Farrel Foundry & Machine Co. in 1927, when he was elected Vice-President of the newly incorporated Farrel-Birmingham Co.

During its long life Birmingham Iron Foundry built special machinery for many purposes, including machines for making wire nails, axe polls and pick-eyes, and for rolling bayonets and gun barrels.

The concern introduced a number of new designs and improved machinery for the rubber industry. Important among these were the bias cutter, hydraulic belt stretcher, multiple roll calenders, the Gordon plasticator, and the Banbury mixer, the latter having since become one of the most, if not the most, important single machine used in the rubber industry today.

For many years prior to World War II, Farrel-Birmingham produced processing machinery for a number of important industries in the United States, and in many foreign countries as well. Peacetime products included then, as they do now, various types of machinery and equipment for the processing of rubber, plastics, linoleum, asbestos, paper, and for grinding sugar cane, rolling nonferrous metals and crushing stone and ore. Many types of rolls, and roll-using machines, including metal rolling mills and rubber and plastics mills and calenders, rank high on Farrel-Birmingham's list of products. Power transmission equipment, such as gears and gear units, for industrial and marine applications form another important product classification. Hydraulic presses, roll grinding machines, gear-making machinery, foundry products and weldments produced by Farrel-Birmingham are also well known to peacetime industry.

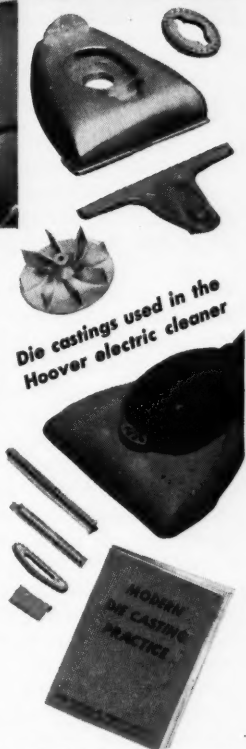


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1 H-P-M die casting machines are the answer to production of intricate parts for Hoover electric cleaners as well as millions of parts that Hoover supplies to other manufacturers. Die castings permit greater freedom of design... better, more uniform, and lighter precision parts... and a decided savings due to high production output, lower material costs, fewer machining operations, less scrap.

2 H-P-M die casting machines are putting the "skids" under production costs in many companies where high priced material and labor are threatening profits. Why not take a tip from Hoover? Change to die castings. Let us show you how to make precision metal parts better... faster... cheaper with H-P-Ms. Two basic types of machines—(1) cold chamber, (2) submerged plunger, are available in a complete range of sizes. Call in a nearby H-P-M engineer to recommend the correct type and size for your job.

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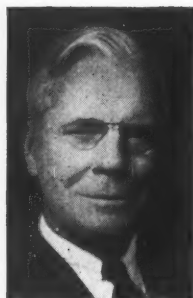
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METAL WORKING PRESSES

REVOLUTIONIZING PRODUCTION WITH HYDRAULICS SINCE 1877



James Finney Lincoln,
President, Lincoln
Electric Company

A Great Man and a Great Idea Built a Great Industry

JAMES FINNEY LINCOLN, world leader in the development of modern arc welding, was born on a farm

near Painesville, Ohio. His father was a preacher, advanced in years, and physically unable to carry on the work of the farm. Thus Jim learned early to labor and, as it happened, hard work agreed with him. He obtained his early schooling by walking $3\frac{1}{2}$ miles to school every day and in time, through dint of savings and a timely loan from an older brother, he was able to finish his education at Ohio State University.

Upon completion of his college career Jim accepted a job with his brother, who had started the Lincoln Electric Company with \$250 of borrowed capital. John's first shop was in the basement of his home in downtown Cleveland. Confident of an eventual market for welding equipment in ever-increasing amounts, Jim convinced his brother of its possibilities and as a consequence their small company undertook the manufacture of this equipment. The turning point in Jim's career came when his brother relinquished management of the business and turned it over to the younger brother.

Jim Lincoln's mind was seething with creative impulses at the very moment when the new age of electricity was sparking with a thousand implications. A record of his enthusiasm for tying technical achievements to useful purposes is contained in a list of

21 patents issued to him in his own name. Many were obtained during the period of his life when he was chafing at the bit of mere salesmanship, and were engineered in his home workshop.

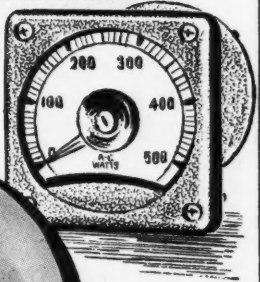
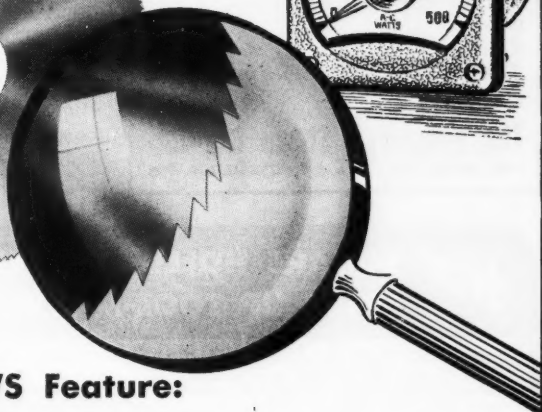
Jim Lincoln was 31 years old when he took off his coat and sat down in the general manager's chair. He had a fair-sized bundle of untried notions and a lot of healthy ambition, but in the matter of executive detail he was green, and he knew it. Faced with the necessity of getting the "hang" of things quickly, he called a group together composed of a representative elected from each department, a representative elected by the foremen, and his superintendent. This group he invited to sit down with him and discuss ways and means for accomplishing the tasks before them, and thus was born an advisory board which to this day still meets.

One day during the depression a member of the board asked "If we produced more could the company pay us more?" Lincoln said he'd try it if the men wished. They did—and the plan became a booming success. Production per man tripled. Lincoln employees became the highest paid workers in industry. Savings resulted for the consumer, with improved, stream-lined electric welders selling at a fraction of their original cost.

Other factors in the spectacular rise of Lincoln Electric from a horse and buggy outfit into the great enterprise that it is today were Jim Lincoln's compelling emphasis upon welding as the basic stock in trade, his intensive

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campaign to gain general recognition of its value to industry, and his long-term program calling for a better and better product at a continually lower price.

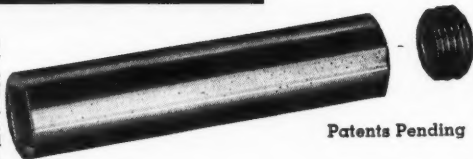
Lincoln Electric soon outgrew its existing facilities. Expansion was accomplished through purchase from the bankrupt Grant Motor Company of its huge automobile plant in East Cleveland. From that point, the growth of the enterprise has been along a steeply rising curve.

In addition to the Cleveland plant, Lincoln Electric now operates factories in England, Canada, and Australia. Where once a mere 100-odd workers carried the load, today the organization numbers thousands. In one year this corporation, owned by the people who work or who have worked with the company, and free of debt, grosses considerably in excess of 35 million dollars. That is the free enterprise saga of James Finney Lincoln.

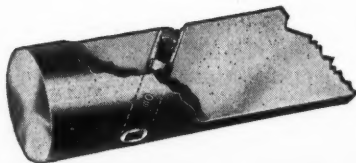
How SQUARE HOLED SLEEVES SPEED UP TOOL-MAKING!

One of the most difficult problems in tool making can be solved easily and quickly with Sturdy Square Holed Sleeves. The perfection of broached square holes can be had in boring bars, milling cutters and many other applications at a small fraction of the cost of imperfect hand-made square holes. The Sturdy Square Holed Sleeve consists of a round sleeve with a perfectly square hole broached through the center. This hole is tapped at one end to receive a back-up screw which is furnished with the Sleeve. The Sleeve can be sweated or pressed into a drilled and reamed hole to make a perfectly square accurate hole in a very few minutes.

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Some Territories Still Open to Jobbers

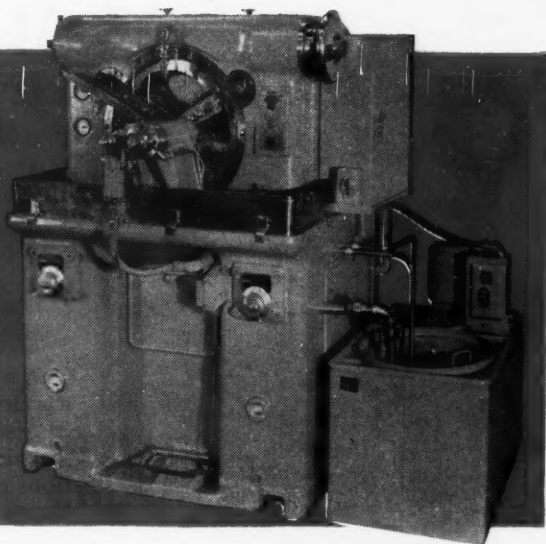
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THE NAMCO
TRIPLE ROLL
HYDRAULIC
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with
Magazine Feed
and
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This new precision high-production machine is the perfect answer for shops that have a large volume of long and short thread work requiring up to class 4 fit and unsurpassed finish.

Operating on the feed-through principle, with interchangeable two-roll or three-roll heads, the Namco Thread Roller regularly produces smoother, more accurate work than ground threads. Capacities range from $\frac{3}{8}$ " up to $1\frac{1}{2}$ " using three rolls—and $\frac{1}{8}$ " to $\frac{1}{16}$ " using two rolls. Because of three-roll operation and three-point support which eliminates distortion, the machine is a "natural" for hollow work.

With the addition of magazine feed and hydraulic loader, just announced, the Namco Thread Roller becomes the fastest, most versatile, *most accurate* means for threading and form rolling, solid or hollow work to close tolerances with fine finish. Send us samples of the jobs you do; we'll do the rest—in quoting you on your requirements.



Complete details on the Namco Thread Roller are contained in this new eight-page bulletin. Ask us for TR 47.

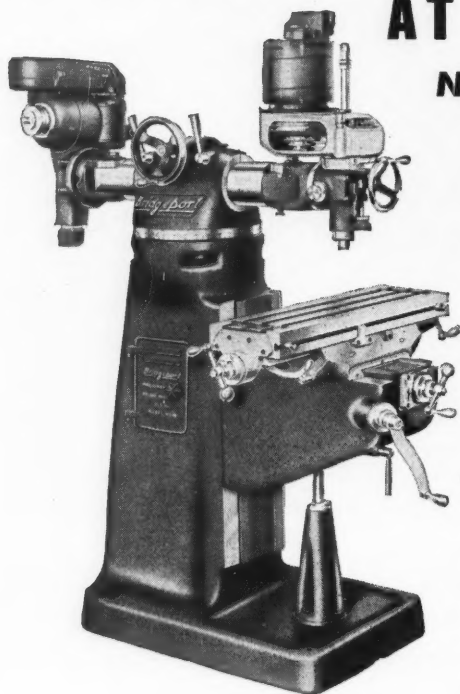
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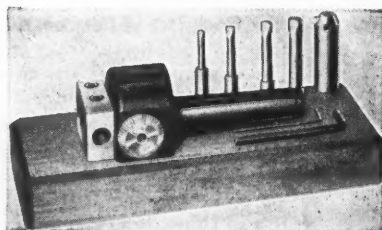
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The wide range and versatility of the Bridgeport Attachment enable it to serve as the complete central machine around which all operations revolve in many small shops. Features include: 15" diameter turret with 5" overarm, rugged construction, table, knee and saddle in convenient front-of-machine position, anti-friction bearings throughout, keyed overarm with worm wheel control for angular settings, large diameter graduated dials. *Write for Bulletin.*

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Specially designed for Bridgeport Machines and Attachments but equally efficient on other machines. Diameter of head, 2 1/4". Adjustment of slide, 3/8". Three holes for 3/8" diameter boring tools giving a range of more than 5". Complete with 5 boring tools and necessary wrenches.

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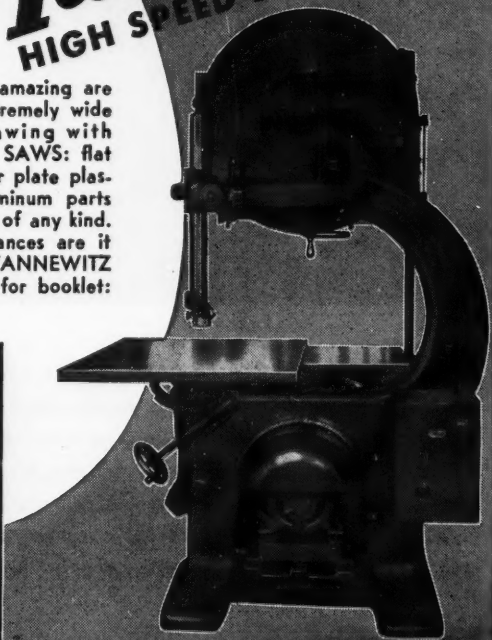
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or Trimming FORMED PARTS
- FAST!

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Cost reductions that are downright amazing are effected in the cutting of an extremely wide variety of materials by friction sawing with TANNEWITZ HIGH SPEED BAND SAWS: flat sheets, hardened or soft steels, armor plate plastics, and many others. Formed aluminum parts can be trimmed without using a rest of any kind. Whatever your cutting problem, chances are it can be done faster and better with TANNEWITZ HIGH SPEED BAND SAWS. Write for booklet: "FRICTION SAWING."



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WINTER BROTHERS TAPS ARE DEPENDABLE



Winter Hand Taps are designed for general purpose work, and are made in taper, plug, and bottoming types. Other Winter Taps include Chip Driver, Machine Screw, Nut, Tapper, and Pipe styles.

MANUFACTURING PROCEDURE

More than modern equipment and good materials are needed to make taps of Winter dependability. Equally critical is the ability to combine the various manufacturing steps into one efficient whole. Winter engineers have more than 47 years' experience in tool design and manufacture. This engineering knowledge, combined with the facilities of a new and modern plant, helps build dependability into Winter Taps and Dies.



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YOUR LOCAL DISTRIBUTOR carries a complete stock of Winter Taps on his shelves—as close to your tapping problems as the telephone on your desk.

Winter Brothers COMPANY

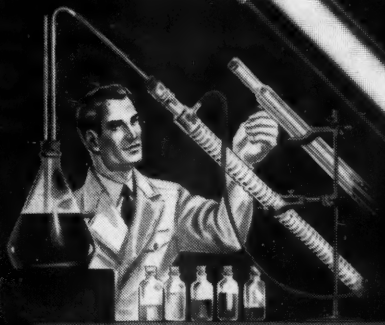
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PERFORMANCE IS BUILT INTO NATIONAL METAL CUTTING TOOLS

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National makes a complete line of standard and special Reamers, including taper and chucking Reamers in high speed and carbon steel, and shell types in high speed steel only. Other National tools include Twist Drills, Counterbores, Milling Cutters, Hobs, and End Mills.



Call Your Distributor

LEADING DISTRIBUTORS EVERYWHERE offer complete stocks of NATIONAL Cutting Tools. Call them for cutting tools or any other staple industrial product.

Every bit of steel that goes into National Cutting Tools is rigidly inspected and tested. At the same time, National conducts its own research into the properties of new steels as fast as they are developed. For example, the qualities of hardness and toughness, as related to tool life, are special subjects of National's raw material studies at all times. Methods like these build better performance into National Cutting Tools.

NATIONAL

TWIST DRILL AND TOOL COMPANY
ROCHESTER, MICHIGAN, U. S. A. Tap and Die Division—Winter Bros. Co.
Distributors in Principal Cities • Factory Branches: New York • Chicago • Detroit • Cleveland • San Francisco



Freedom of Creative Effort Fosters Engineering Progress

The material presented here is conclusive evidence of the manner in which modern American machine tools have contributed to the high standard of living which prevails in America.

Surface Hardening 3000 Ring Gears Per Day

AN outstanding contribution in the field of heat treatment was recently made by The Cincinnati Milling Machine Company when they placed an electronically controlled gas selective surface hardening machine on the market. This automatic, high production machine hardens only the surfaces desired, holding the pre-quench temperature of the hardened portion within ten degrees. The remainder of the part is not affected by the operation, and core properties are retained.

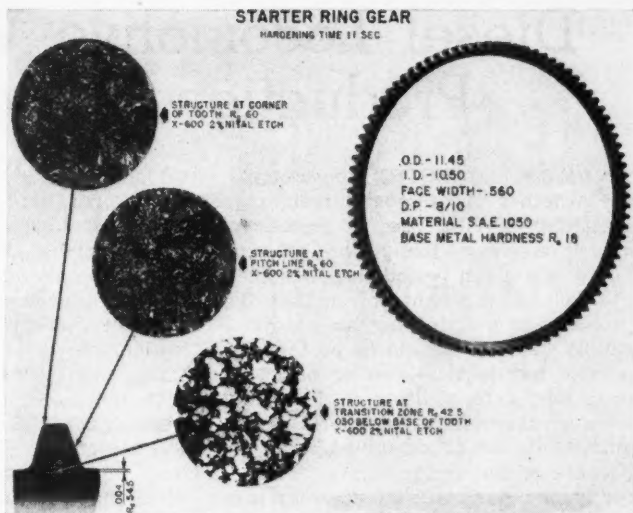
An equally important advantage will be found in the greatly reduced distortion of Flamatic hardened parts. For the parts shown in Fig. 1, accuracy of flatness and concentricity has been improved to the almost unbelievable standard of one-fifth the formerly accepted allowance. The parts can be

machined more closely to finished dimensions before Flamatic hardening; costly corrective operations are greatly reduced or entirely eliminated; scrapped parts due to hardening are a thing of the past.

For comparable rates of production, the capital investment in Flamatic equipment is substantially lower than for other types of heat treating equipment. The machine shown in Fig. 2, installed in the plant of a mid-west gear manufacturer, has an output of 3000 starter ring gears per day. Due to the gradient hardness pattern, the teeth of these gears are exceptionally tough and have a high surface hardness for wear resistance.

Operators of Flamatic Hardening Machines approach the "white collar" classification in cleanliness of their

Fig. 1—Metallurgical Laboratory Report on Starter Ring Gear

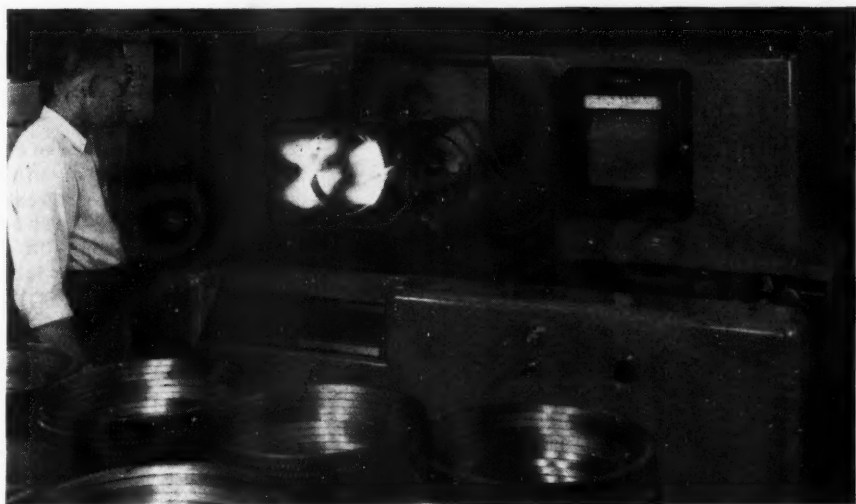


work. Manual operation consists of loading the mandrel and pressing a button; the remainder is automatic. The quenching reservoir is enclosed, and the work is automatically conveyed out of the quench.

Briefly, Cincinnati Flamatic Hardening Machines contribute to the American standard of living by flattening out the curve of inconsistency for hardened parts; by reducing the cost

of subsequent operations, and therefore reducing the overall cost of the part; by reducing occupational hazard and making heat treating a more desirable way to earn a living.

Fig. 2—View of Cincinnati Flamatic Hardening Machine in Operation



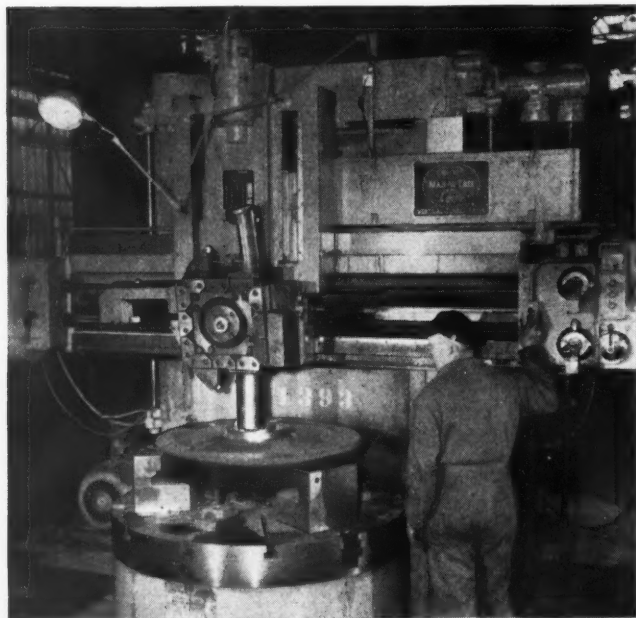
Diesel Locomotive Wheel Production Tripled

DIESEL-ELECTRIC locomotives, whether in passenger, freight or switching service, are, of necessity, kept in service so many more miles or hours in a given period than has been the case with steam power that the problem of maintaining an adequate supply of steel wheels to protect the service has become one of no mean proportions. In addition to a demand for a greater number of wheels the requirements as to machined surfaces, because of the design of traction motor trucks, has made it necessary radically to revise practices with respect to the machining of wheels and to explore new fields in the matter of machine tools and tooling equipment.

The Boston & Maine, which, for example, operated road Diesel power for a total of 4,529,683 locomotive miles and switching Diesels for a total of 239,144 hours during the year 1946, found that even with the most modern manually controlled wheel boring equipment in its North Billerica, Mass., shops it was not able to keep up with the mounting demand for steel wheels for Diesel locomotives, rail cars and passenger equipment. In 1945 that road initiated an intensive study of wheel finishing operations which resulted in the purchase of a 54-inch Bullard Man-Au-Trol vertical turret lathe for steel-wheel finishing. This machine was installed and placed in

regular operation late in 1947. It is able to turn out more than three times the maximum output of the manually controlled vertical turret lathe formerly used on this job.

The former method of machining these wheels was to chuck them in a Bullard 54-inch vertical turret lathe and per-



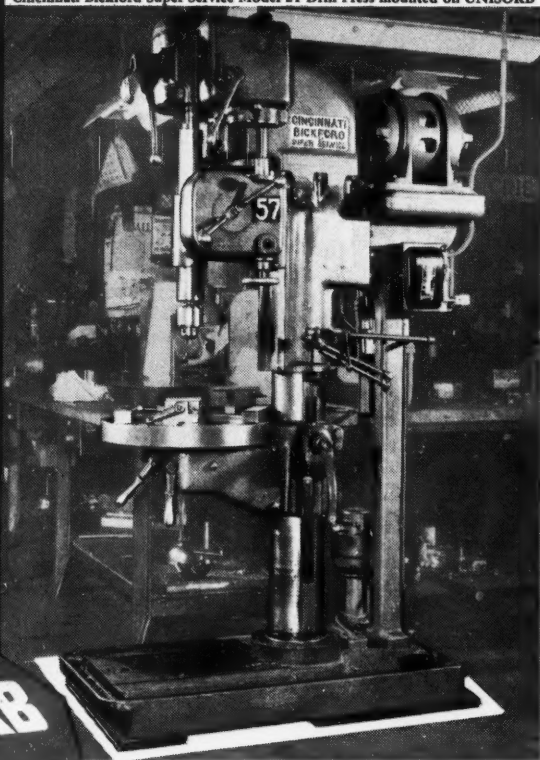
Bullard Man-Au-Trol vertical turret lathe for machining Diesel locomotive wheels.

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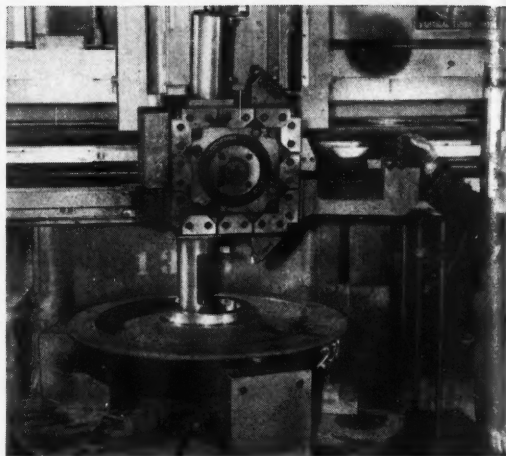
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In turret index Position 1 the rough boring is performed.



form the operations shown in Table I by manual control. The old method required two chuckings, the wheel being turned over after operation No. 8, shown in the table. Under the old method 9 of the 14 operations involved the use of high-speed steel tools, the remaining 5 operations making use of carbides. On the new Man-Au-Trol all the tools are carbides.

On the new machine the average time of 64 minutes shown in Table II is routine production, although the machine is capable of going through the automatic cycle in a total floor-to-floor time of less than 50 minutes.

The Man-Au-Trol vertical turret lathe is basically the Bullard Cut Master having a control mechanism which makes it possible to perform automatically any job within the range of the

machine which requires 39, or less, functions. The 54-inch machine installed at the North Billerica shops is equipped with special chucking and tooling equipment for handling 33-inch, 36-inch and 40-inch steel wheels and is the first machine of its type to be used in a railroad shop. While it is kept busy, at the present time, on Diesel wheels the machine can be used for the machining of other parts required by the railroad and can be used either as an automatic machine or operated by manual controls.

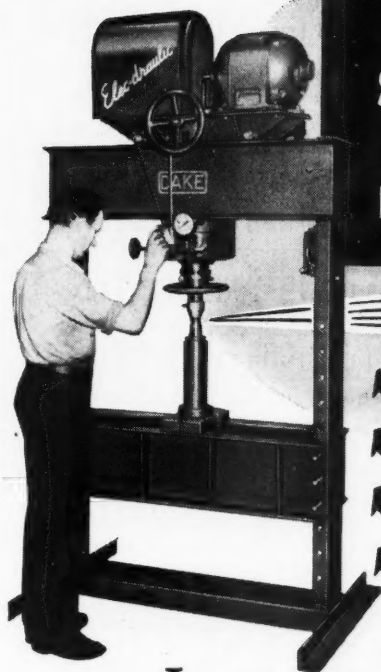
An interesting feature of the machine is that the automatic functions are pre-established by securing function dogs on the control drum in operation sequence, then manually bringing the tools through each re-

Table I—Former Method of Machining 40-in. Diesel Locomotive Wheels on Bullard 54-in. Vertical Turret Lathe

Operation	Main head	Side head	Tools Used
First Chucking:			
1. Face rim		x	Carbide
2. Rough bore	x	..	Carbide
3. Finish bore	x	..	High speed
4. Rough face hub	x	..	Carbide
5. Finish face hub	x	..	High speed
6. Rough turn outside diameter of hub ..	x	..	High speed
7. Finish turn outside diameter of hub ..	x	..	High speed
8. Chamfer radius on bore	x	..	High speed
Second Chucking (wheel turned over):			
1. Rough face hub	x	..	Carbide
2. Finish face hub	x	..	Carbide
3. Rough turn hub	x	..	High speed
4. Finish turn hub	x	..	High speed
5. Turn 20-deg. angle	x	..	High speed
6. Turn 45-deg. angle	x	..	High speed

Total Time Required:

Floor-to-floor (machining and handling time)—4 hours



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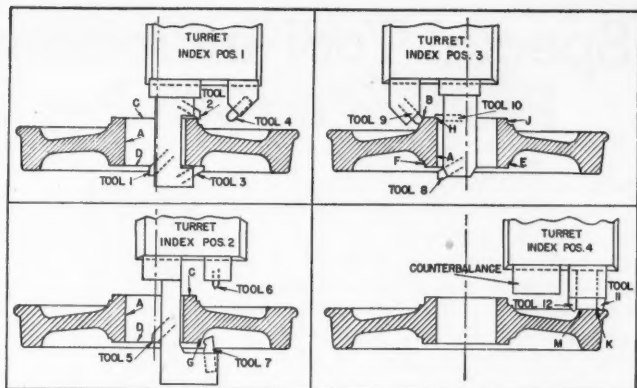
Table II—Operation-Data for A-40 Diesel Wheels on Bullard 54-inch Man-Au-Trol

Oper. No.	Main Head Movement					Up	Down	Operation	Turret Index Position	Tool Use	Work Diam. in.	Length of cut		Table Speed in. per min. r.p.m.	Feed- rev. min.	Time* sec.
	Tr.	Feed	R	L	5	6	7					In.	ft			
1	2	3	4	5	6	7		To position	9	None	11	12	13	14	15	16
2	2	3	4	5	6	7		To position	1	None	—	—	—	—	—	—
3	2	3	4	5	6	7		To position	1	None	—	—	—	—	—	—
4	2	3	4	5	6	7	x	Rough bore A	1	None	9.000	6.500	115	50.4	.020	8
5	2	3	4	5	6	7	x	Rough 3/4 in. radius B	1	1	13.500	0.750	175	50.4	.015	0
6	2	3	4	5	6	7	x	To position	1	None	—	—	—	—	—	—
7	2	3	4	5	6	7	x	Straddle face hub C and D	1	2&3	13.500	1.875	175	50.4	.015	4
8	2	3	4	5	6	7	x	To position	1	—	—	—	—	—	—	—
9	2	3	4	5	6	7	x	To position	1	—	—	—	—	—	—	—
10	2	3	4	5	6	7	x	To position	1	—	—	—	—	—	—	—
11	2	3	4	5	6	7	x	Semi-finish bore A	2	5	9.215	6.375	180	74.0	.020	5
12	2	3	4	5	6	7	x	To position	2	—	—	—	—	—	—	—
13	2	3	4	5	6	7	x	Semi-finish E	2	—	—	—	—	—	—	—
14	2	3	4	5	6	7	x	To position	2	7	13.500	1.375	175	50.4	.083	3
15	2	3	4	5	6	7	x	Semi-finish E	2	—	—	—	—	—	—	—
16	2	3	4	5	6	7	x	To position	2	—	—	—	—	—	—	—
17	2	3	4	5	6	7	x	Cut 20-deg. Angle F	2	7	12.245	1.500	160	50.4	.010	2
18	2	3	4	5	6	7	x	Finish E	2	7	12.245	1.375	160	50.4	.010	2
19	2	3	4	5	6	7	x	Cut 45-deg. chamfer G	2	7	12.245	.250	160	50.4	.015	0
20	2	3	4	5	6	7	x	Finish bottom face hub C	2	7	12.245	1.875	280	88.0	.010	3
21	2	3	4	5	6	7	x	To position	2	—	—	—	—	—	—	—
22	2	3	4	5	6	7	x	To position	2	—	—	—	—	—	—	—
23	2	3	4	5	6	7	x	To position	2	—	—	—	—	—	—	—
24	2	3	4	5	6	7	x	To position	2	—	—	—	—	—	—	—
25	2	3	4	5	6	7	x	To position	2	—	—	—	—	—	—	—
26	2	3	4	5	6	7	x	To position	2	—	—	—	—	—	—	—
27	2	3	4	5	6	7	x	Finish bore A	3	8	9.223	6.375	210	88.0	.015	8
28	2	3	4	5	6	7	x	Chamber bore H	3	10	9.223	.250	180	74.0	.020	0
29	2	3	4	5	6	7	x	Finish 3/4 in. radius B	3	9	13.000	1.125	250	74.0	.015	1
30	2	3	4	5	6	7	x	To position	3	—	—	—	—	—	.083	—
31	2	3	4	5	6	7	x	To position	3	—	—	—	—	—	.010	—
32	2	3	4	5	6	7	x	Finish hub diam. J	3	9	13.000	1.125	250	74.0	.010	1
33	2	3	4	5	6	7	x	Feed left to clear tool	3	—	—	—	—	—	—	—
34	2	3	4	5	6	7	x	To position	3	—	—	—	—	—	—	—
35	2	3	4	5	6	7	x	To position	3	—	—	—	—	—	—	—
36	2	3	4	5	6	7	x	To position	3	—	—	—	—	—	—	—
37	2	3	4	5	6	7	x	Manual operation - Face rim K	4	11	40.000	3.500	200	19.7	.015	12
38	2	3	4	5	6	7	x	Manual operation - Cut wear limit groove M	4	12	35.000	.250	180	19.7	.015	5
39	2	3	4	5	6	7	x	To starting position	4	—	—	—	—	—	—	—
40	2	3	4	5	6	7	x	Turret indexes to Position 1	4	—	—	—	—	—	—	—
Total Cutting Time																56
Loading & unloading																8
Floor-to-floor time																64

*Combined cutting time and machine movement time

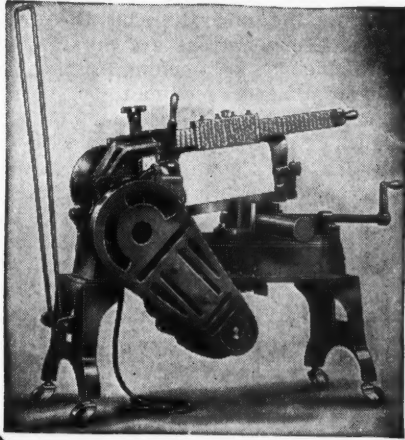
Data for the machining operations indicated by these drawings are given in Table II.

spective cut. At the completion of each cut a setting is made on the Man-Au-Trol Detector for that operation. When all the operations have been completed and all of the function stops set, the machine is then thrown into automatic operation and becomes 100 per cent automatic. Should it be desired to machine an odd part of another design, for any reason, the machine may be thrown out of automatic control, the piece machined manually and then production continued on the part for



which the automatic functions previously had been set, without further adjustments other than setting the original tooling. The ease with which the machine can be changed from manual to automatic operation provides almost unlimited flexibility, reduces the manual effort required, and makes for finer accuracy.

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FOR some classes of work special machine tools are more productive and efficient than standard machine tools because they are designed to do one job. Special tools may be designed to meet the requirements of the job more exactly than a machine which is designed to fit a number of different types of jobs.

Figure 1 shows an Ingersoll 2-Spindle Rotary Table Milling Machine that was built for the Buick Motor Division of General Motors to machine an exhaust manifold valve. The machine, fixtures and cutters were built specially for this particular job. The work was previously done on standard machinery with special fixtures and attachments.

The machine consists primarily of a base carrying a rotary table and a housing carrying a saddle having two

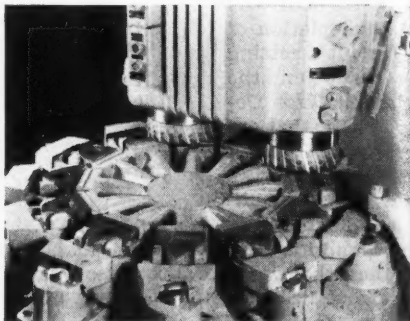


Fig. 2—Closeup view of Rotary Table Showing Workpieces in Position

quill-mounted vertical spindles. One motor is provided for driving the spindles and is located in the frame of the machine. One motor is provided for feed to the rotary table and is located in the base. Push buttons are provided on the right-hand side of the machine for starting and stopping the drive motor. Push buttons are provided on both sides of the machine for starting and stopping the feed motor.

A closeup view of the rotary table is shown in Fig. 2. The workpieces are automatically clamped in the fixture, thus the only work required of the operator is to place a new piece in the fixture and remove a finished piece. The automatic clamping feature enables the operator to keep pace with the production, which is about 165 per hour, net.

The cutters are Ingersoll Shear Clear carbide-tipped cutters. The feed rate is 48 inches per minute.

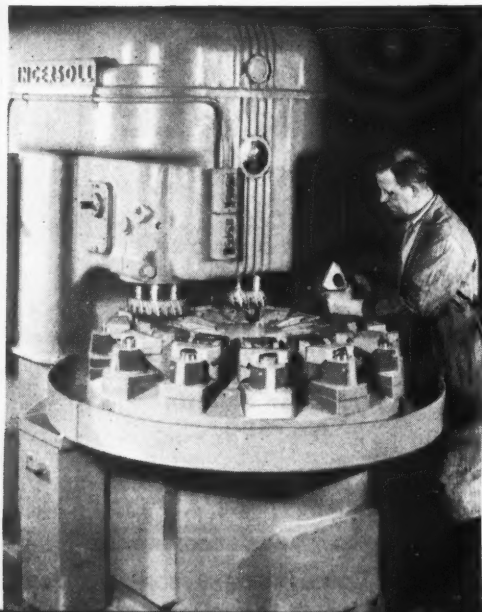


Fig. 1—Illustration Showing Ingersoll 2-Spindle Rotary Table Milling Machine.

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Cutting Operations Combined to Increase Crankshaft Production

SEVERAL individual cutting operations on crankshafts have been combined in a single cycle in order to increase the productive capacity of the LeBlond DM Automatic Crankshaft Lathe shown in the accompanying illustration. These operations consist of finish turning the stub, flange, and intermediate line bearings on a six-cylinder automotive crankshaft.

The lathe is designed primarily as a four-station indexing machine and is built on the revolving drum principle for finish turning all line bearings. The use of this type of lathe has eliminated completely the need for rough grinding operations. The fourth station,

loading, makes possible continuous uninterrupted operation of the machine without time lost for loading and unloading.

The lathe is powered by combination electric-hydraulic motor units, controlled by readily accessible electric push buttons. A red and green control light system is provided which not only protects the operator, but also gives a visual check of the progress of the work.

The production data on the crankshaft are as follows:

Total feed time -----1.410 minutes
Return traverse -----.054 minutes
Indexing -----.036 minutes

Total machining cycle ---1.500 minutes

Hourly production...40 gross for 60-minute hour

Hourly production ---30 net for 48-minute hour.

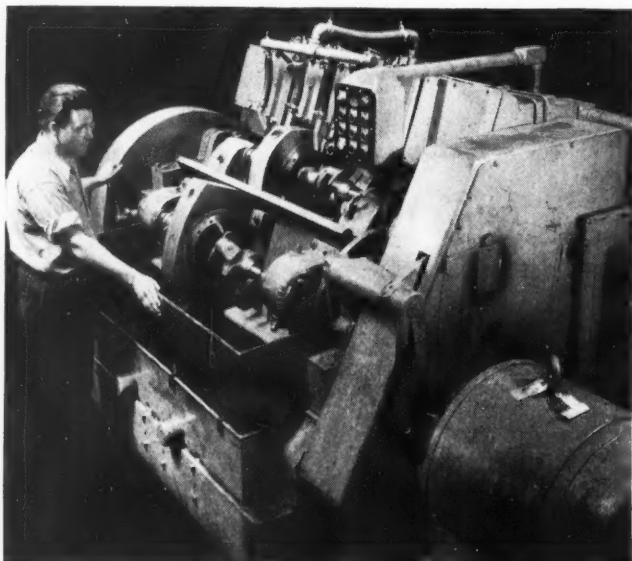


Fig. 1—View of LeBlond DM Automatic Crankshaft Lathe designed especially for finish turning stub, flange, and intermediate line bearings on a six-cylinder automotive crankshaft.

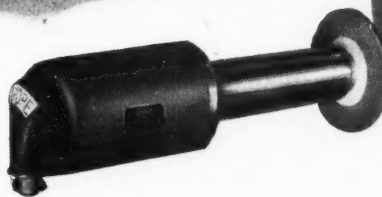
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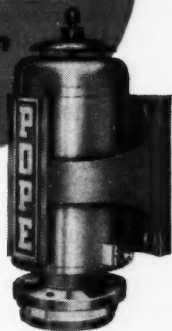
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No. 53

Profile Milling Applied to Roll Pod Machining

PLUNGE cut and contour milling successfully applied to machining rolling mill roll pods represents a definite advance in simplifying this specialized and difficult class of work. The new machining method centers around the use of a specially designed roll holding fixture on a floor type Giddings & Lewis horizontal boring, drilling and milling machine equipped with a synchronized dual hydraulic tracer control attachment. Tungsten carbide cutters designed for plunge cut boring and plunge cut profiling rapidly remove metal in all roughing operations. Contour milling with a sectional slab mill then gives required accuracy and final finish to the roll pods.

To appreciate the machining problem confronting roll manufacturers, consider the typical pod shapes illustrated by templates in Fig. 1. Both single and double radius pods are shown. These are just a few of the forms that can be readily duplicated in the roll end when plunge cut and contour milling methods are used.

Fly cut boring has been the conventional method used for rough shaping roll pods by many of the country's leading producers of rolls. Analysis

proves this to be a laborious and time-consuming procedure, many hours of hand grinding being required to produce the final finish.

First, a sweeping cut is made to remove as much metal as possible from between roll teeth or lobes. Secondly, it is necessary either to reset the fly cutter, or to change cutters to produce the desired bottom radius. This second operation results in high points on either side of the cut. These points must be removed in the third operation by a series of shallow fly cuts. After as much metal as practical has been removed in this manner, the roll is sent to the hand grinder for finishing. High points still existing must then be ground off to produce final finish.

Overall time for machining pods varies according to skill of the boring machine operator and number of cuts required to remove the bulk of the metal. Time taken for hand grinding depends on how much remaining metal must be removed to establish a reasonable bearing fit. Allotted time for grinding ranges from 1½ to 4½ hours.

As already mentioned, the new method of machining pods by plunge cut and contour milling, as now employed successfully in the roll shop of a large

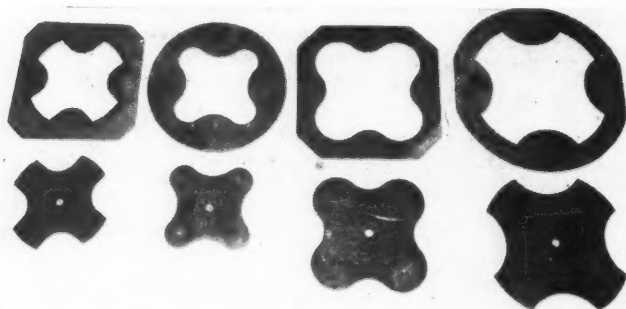


Fig. 1 — These steel templates show variety of pod shapes and sizes possible to machine using a horizontal boring machine equipped with hydraulic tracer-control attachment

Fig. 2—This rear roll support is adjustable on its base. In addition, various size bushings can be placed in bearing ring to accommodate different size rolls.



steel company, centers around a roll holding fixture especially designed for this work. This machine accessory or fixture is made up of two components, a forward roll support and rear roll support. When the horizontal boring machine is set up for this work, the fixture supports merely are placed on the machine floor plate and bolted down. An illustration of this device, showing its position in relation to the machine spindle, is presented in Fig. 3.

Bronze bushings are fitted over the roll ends. These in turn are locked in steel bearing rings which rotate on hardened roller type bearings. Fig. 2 shows the rear bearing support with roll end, bronze bushing and roller assembly in position. Changing of bushings in the bearing ring permits mounting of different diameter rolls in the fixture. Handling rolls of various lengths is accomplished simply by moving the rear roll support toward or away from the forward support. The rear support has a hand operated worm and gear to move it on its sub-base. This feature permits rapid final adjustment thus minimizing overall setup time.

Both supports are equipped with over-arm clamps. When open, these permit placing of roll—complete with bushing and bearing assembly—in the fixture. After roll is seated, over-arm clamps are closed and hold down bolts tightened. Thus, accurate adjustment of bearing tension to ensure rigid support of the roll is readily attained.

Mounted on the forward support and forming an integral part of it is the roll rotating mechanism. This is operated by a hydraulic feed motor, through reduction gears. This roll rotating motor is synchronized with a similar motor attached to the machine headstock elevating screw. Both are activated automatically by a solenoid-operated tracer control which follows a steel template.

Incorporated in the design of the rotating mechanism is a 360-tooth spur gear mounted on the steel bearing ring.

A roll may be rotated at varying speeds to provide proper feed for contour milling operations. Also it can be indexed and locked for plunge cut boring and spline milling. The locking device, when meshed with the ring gear, provides a positive means for obtaining correct roll graduations through 360 degrees. An interlocking switch is provided as a safety factor and when the gear is locked it is impossible to apply power to rotate the roll.

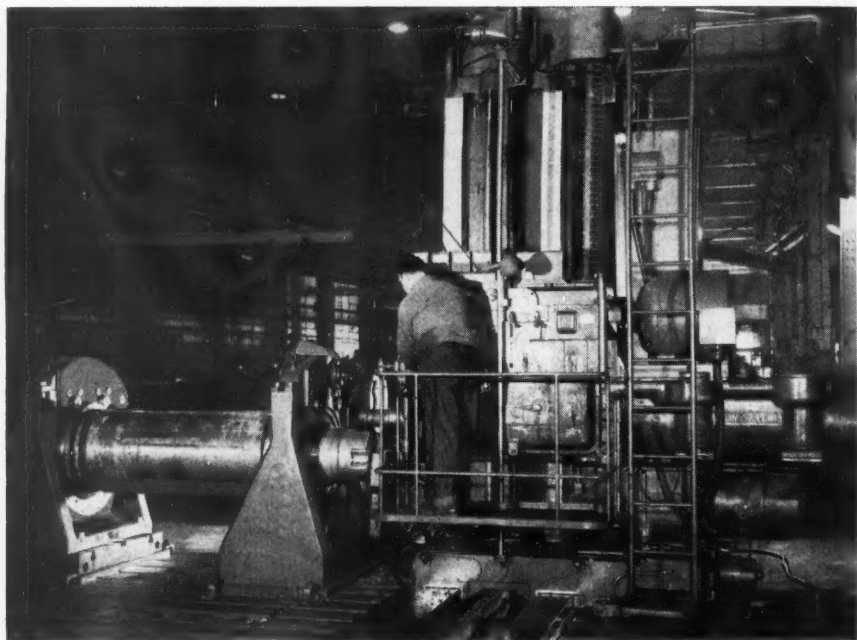


Fig. 3—Overall view of complete setup used to machine rolls on floor-type horizontal boring, drilling and milling machine

In order to mill splines on the roll pod, or to cut keyways, it is necessary to reset the two roll holding fixtures by turning them 90 degrees. The roll then will lie at right angles to the machine spindle. Any number of splines can be milled in the pod, depending upon the indexing.

Synchronized Tracer Control Attachment

Using a dual hydraulic tracer control attachment on the horizontal boring machine, an infinitely variable combination of feeds is possible. Two hydraulic motors control these power

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feeds. Both are synchronized to respond to the solenoid tracer control.

One motor rotates the roll. The other raises and lowers the machine headstock. This combination of feed mo-

Table I—Typical Job Facts and Time Study for Machining Rolls

No. 1	Diameter of roll	15 1/4 in.
	Radius	4 in.
	Length of pod	
	One end	13 1/4 in.
	Opposite end	8 1/2 in.
	Depth bottom root dia.	10.4 in.
	Former machining time to complete	145 hr. 38 min.
	Present machining time to complete	21 hrs. 47 min.
No. 2	Diameter of roll	7 1/2 in.
	Radius	1 in.
	Length of pod	
	Both ends	4 in.
	Depth bottom root dia.	4 in.
	Former machining time to complete	8 hr. 32 min.
	Present machining time to complete	4 hr. 39 min.
No. 3	Diameter of roll	9.4 in.
	Radius	1.27 in.
	Length of pod	
	Both ends	6 1/2 in.
	Depth bottom root dia.	6 in.
	Former machining time to complete	25 hr. 53 min.
	Present machining time to complete	16 hr. 10 min.
No. 4	Diameter of roll	7 in.
	Radius	2 in.
	Length of pod	
	Both ends	5 1/2 in.
	Depth bottom root dia.	4 1/2 in.
	Former machining time to complete	11 hr. 48 min.
	Present machining time to complete	5 hr. 30 min.
Typical Cutter Data		
Diameter of mill		3 in.
Feed		.025 in.
Speed		250 R.P.M.
Depth of cut		1/4 in.

tions will produce any contour or pod shape through template control.

Steel templates are mounted on a revolving face plate which rotates at the same rate as the roll. A stylus, identical in size to the cutter on the tracer arm, follows this template. Its resulting rise and fall activates a solenoid which in turn controls the hy-

For
"Near Neighbor" Service

From Foundry to Finish
THROUGH A CYCLE OF SPECIAL MACHINES...
...SPECIAL SKILLS



PRODUCTO
Special
DIE SETS

Magnetic chuck on Hanchett grinder holds two die beds (38" x 38" each) for vertical surface grinding to a satin finish.

There's no need to "roll your own" when Producto can supply you with Specials of the highest quality in the shortest time.

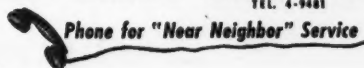
Through long experience, we have developed custom-built machinery, specifically geared to handle close tolerance work on all types of die-sets from small, intricate designs to giants of several tons.

"Near Neighbor Service" from 26 cities gives you speed and convenience... provides personal discussion of your requirements through telephones listed herewith.

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THE PRODUCTO MACHINE COMPANY

960 HOUSATONIC AVE.
 BRIDGEPORT 1, CONN.
 TEL. 4-9481



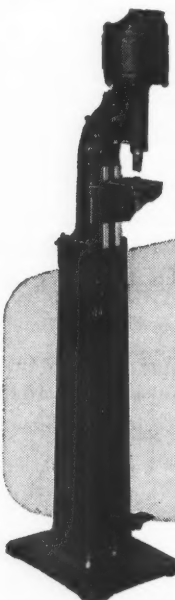
draulic motors which in their turn control the cut and speed at which the roll revolves.

Undoubtedly the most advantageous feature of the horizontal boring machine in any steel mill machine shop is its unusual flexibility in handling a broad range of work. Machining roll pods is only one of many jobs which can be handled by this versatile machine tool. The fixture and attachments heretofore mentioned may be used on standard horizontal boring machines. They can be rapidly adapted to perform different profiling operations, and are removed equally fast when this type of work is completed. The machine is then ready to perform a wide range of boring, drilling, milling, tapping and turning operations.

Through the different standard movements of the floor type machine, practically any work pattern can be

handled provided that the part is capable of being placed within the range of the machine spindle. Oftentimes this is simplified by the longitudinal traverse of the machine column on its runway, vertical headstock movement and in-and-out spindle feed. As a result of the machine's versatility and feed movements, it is possible to repair and maintain all kinds of mill equipment, to recondition and rebuild old rolling mills and to fabricate all types of mill components, without resorting to use of special or single purpose machine tools.

In addition to having the necessary capacity to handle all types of steel mill work, the horizontal boring machine cuts down the overall or floor-to-floor time. An actual record of the time required to machine rolls is shown in Table I. Comparable savings in time can be anticipated on other work.



LINLEY

FOR NOISELESS, HIGH SPEED RIVETING

Rotary spinning principle shapes uniform heads, silently... capacities up to 3/8 inches diameters. Adjustable spindle stroke, controlled pressure... double row radial thrust bearing supports spindle, assures long life. Table elevating screw prevents slipping. Six floor or space-saving bench models...sturdily built for trouble-free operation under severe production schedules.

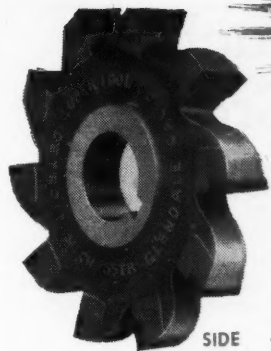
**FOR COMPLETE INFORMATION,
WRITE FOR BULLETIN.**

**LINLEY BROTHERS CO., 661 STATE ST. EXTENSION
BRIDGEPORT 1, CONNECTICUT**

FROM THE MOST COMPLETE
STANDARD CARBIDE
TOOL LINE -

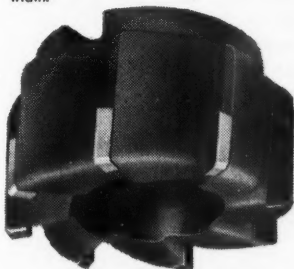
CARBIDE MILLING CUTTERS

FOR EVERY JOB



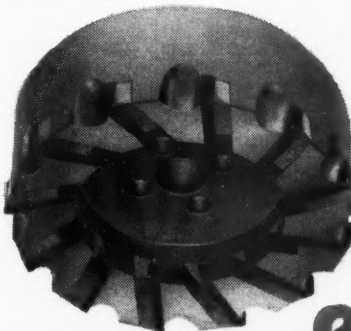
SIDE
MILLS

Brazed tips on alloy steel bodies. 3' to 8" diameters stocked in 1/4" to 1" width.*



SHELL END MILLS

Brazed tips on alloy steel bodies. 1 1/4" to 6" stocked.*

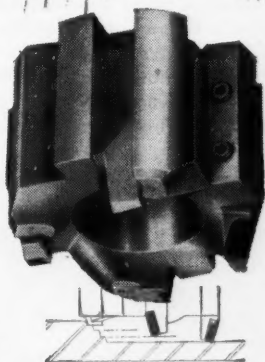


END MILLS

2 to 8 flutes 1/4" to 4". Straight, taper, and special shanks. Ruggedly designed for heavy cuts.*

INSERTED BLADE
FACE MILLS

Solid carbide blades. Rugged design. Easy blade interchange. No screws in body. 4" to 14" stocked.*



ROTARY BROACHES

Step tooth design means lighter cut for each blade and higher speeds. Stocked 4" to 6".*

*Specify, when ordering, type of material to be machined.

STANDARD AND SPECIAL

SUPER

Carbide Tools

SUPER TOOL COMPANY

21650 Hoover Rd., Detroit 13, Michigan

5210 San Fernando Rd., Glendale 3, California

Special Milling Machine Increases Truck Crank- shaft Production

THE Kearney & Trecker milling machine shown in the accompanying illustration was primarily designed to expedite and simplify the milling of 8 locating pads on crankshafts of various sizes. By means of a special fixture, the crankshafts are held between hydraulically operated centers which clamps them by means of hydraulically operated equalizing clamps. The fixture centers can be moved apart or together in order to accommodate crankshafts of various lengths.

Six horizontal and two vertical spindles are mounted in a horizontal sliding head having hydraulic feed and rapid traverse movements on a rectan-

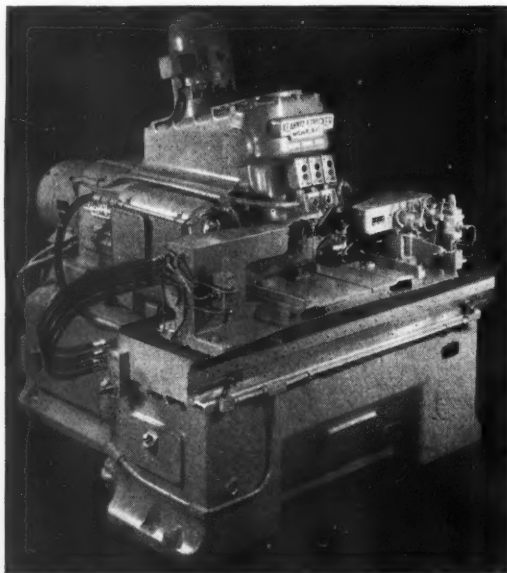
gular way. All spindles are mounted in eccentric quills and are provided with variable speeds through pick-off gears.

Like the head, the table is equipped with hydraulically controlled feed and rapid traverse movements which can be varied within a suitable range.

The cutting cycle is completely automatic. The operator has merely to load the workpiece on two V-blocks and engage the hydraulic levers controlling the centers and equalizing clamps. The cycle of operation is as follows:

1. Load crankshaft
2. Centers pick up crankshaft
3. Crankshaft is located readily by a swing locator from a prick punch mark.
4. Equalizing clamps are engaged.
5. Head feeds forward to depth and table feeds left.
6. Head and table rapid traverse return.
7. Unclamp fixture and unload crankshaft.

High speed steel shell end milling cutters are used. A production of 69 pieces per hour at 85 per cent efficiency is readily obtained with this equipment.



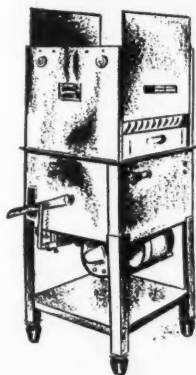
Kearney & Trecker Special 8-Spindle
Milling Machine for Truck Crank-
shaft Production

Sandpaper in the Kitchen



THE BOILED EGG YOU HAD FOR BREAKFAST THIS MORNING WAS PROBABLY CLEANED UP BY JEWELITE ABRASIVE CLOTH. A FINE-GRIT CLOTH, CUT IN SPECIAL SHAPES OR MADE INTO BANDS, HAS BEEN ESPECIALLY DESIGNED FOR THIS DELICATE JOB, AND IS USED BY MANY POULTRY FARMS. THIS IS ONLY ONE OF THE UNUSUAL SANDING PROBLEMS THAT AP ENGINEERS HAVE SOLVED.

AND THE WOODEN BOWLS FOR THE CHEF'S TOSSED GREEN SALAD ARE GIVEN THAT SMOOTH INSIDE FINISH WITH JEWEL GARNET. MANUFACTURERS HAD BEEN TROUBLED BY UNEVENNESS AND GOUGED EDGES. AFTER SWITCHING TO JEWEL GARNET BELTS, WITH THE EXCLUSIVE VELVET JOINT, THE PROBLEMS DISAPPEARED AND PRODUCTION WAS DOUBLED.



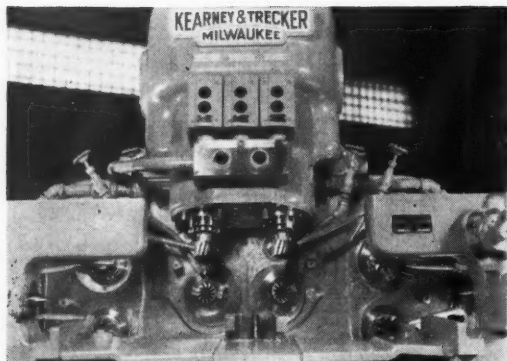
JEWEL ABRASIVES ARE ALSO USED TO FINISH THESE EFFICIENT AUTOMATIC DISHWASHERS. THE CORNERS AND EDGES OF THE METAL CABINETS ARE POLISHED WITH #80 JEWELOX CLOTH S73. THE MANUFACTURER REPORTS, "THIS CLOTH IS THE BEST WE'VE EVER USED."

SO REMEMBER JEWEL WHEN YOU ORDER COATED ABRASIVES. THERE'S A JEWEL PRODUCT FOR EVERY POLISHING AND GRINDING NEED, AND PROPERLY USED JEWEL ABRASIVES WILL SPEED YOUR WORK, CUT YOUR COSTS!



Abrasive Products, Inc.

SOUTH BRAINTREE 35, MASSACHUSETTS - MAKERS OF JEWEL COATED ABRASIVES



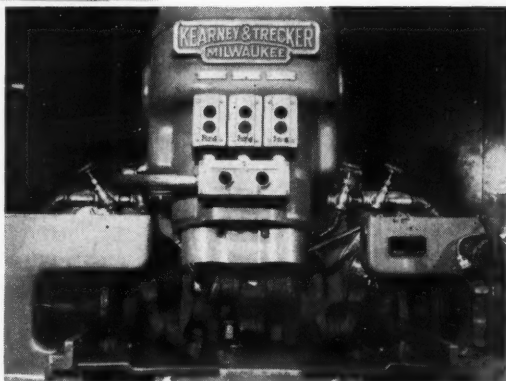
(Left)—Closeup view of Special 8-Spindle Milling Machine for Truck Crankshaft Machining



(Below)—View showing Crankshaft in Position on Special 8-Spindle Milling Machine

Through the use of this machine the crankshaft manufacturer is able to eliminate a considerable amount of work-piece handling and a concern for holding cutter size on the arbor gang setups formerly employed. Arbor gangs themselves have been eliminated in favor of fixed cutter position for each surface to be milled.

In addition, the Kearney & Trecker Special 8 - Spindle milling machine is engineered and designed in such a manner that it can be successfully applied to the machining of various sizes of crankshafts. Changeover from one size crankshaft to another may be accom-



plished in a minimum amount of time.

The quality of the finished product has been greatly improved through the simultaneous cutting operation of the machine.



INTERNAL THREADING AND BORING TOOLS

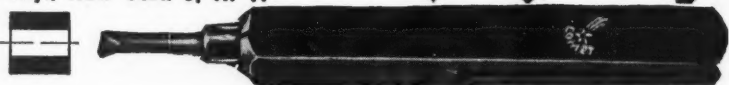
For holes from $\frac{1}{8}$ " upwards, 15 different sizes. The accurate thread angle is maintained through each sharpening until tool is entirely worn down. Small head-long cutting surface for regrinding.

COMET TOOL CO.

738 B'way., New York 3, N. Y.



Write for
Complete
Data.



Smooth...Fast...Accurate

THE R. D. WOOD STRAIGHTENING PRESS



For STRAIGHTENING SHAFTING... AXLES... ROUND BARS... RODS

Modern in design with quality construction this 200-ton R. D. WOOD Straightening Press has a *plus factor* . . . increased production. Heavy welded steel makes up the press frame which carries individual cast steel main and pull-back cylinders. Length of press table is 73" with 13" of gap between dies. On the vertical frame face the resistance blocks are movable. The table has four heavy stationary

rollers for shifting shafts lengthwise, and four sets of lifting and turning rollers air-cylinder operated. An adjustable stop, which will take full press load, is located centrally on the press frame to prevent over-bending. High and low pressure pumps, operated by a 20-h.p. motor, provide a ram speed of 72" per minute for low pressure closing. High pressure ram speed is 8.5" per minute. Send today for literature.

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EST. 1803

R. D. Wood Company

PUBLIC LEBRON BUILDING, THIRK. E. PA.

One Machine - One Operator - One Hour - 74 Internal Helical Gears

INCREASING the production of internal helical gears from 6 per hour on a single-spindle machine to 74 per hour by means of the Fellows No. 10 Gear Shaper shown in Fig. 1 has been the completely satisfying experience of a large manufacturer of automobile transmissions. This machine is equipped with automatically operated diaphragm chucks, which release and clamp the work as the turret reaches the loading position. Each unit stops automatically as it reaches the load-

ing position, enabling the operator to remove the cut blank and insert an uncut blank.

The turret continues rotating as loading and unloading progresses. Lights on the control panel "flash on" notifying the operator when the work is unclamped and clamped. When the work is clamped, he pushes the "start" button on the "unit" to start it operating again. As shown in Fig. 2, loading and unloading is being accomplished on one "unit" while the remaining 9

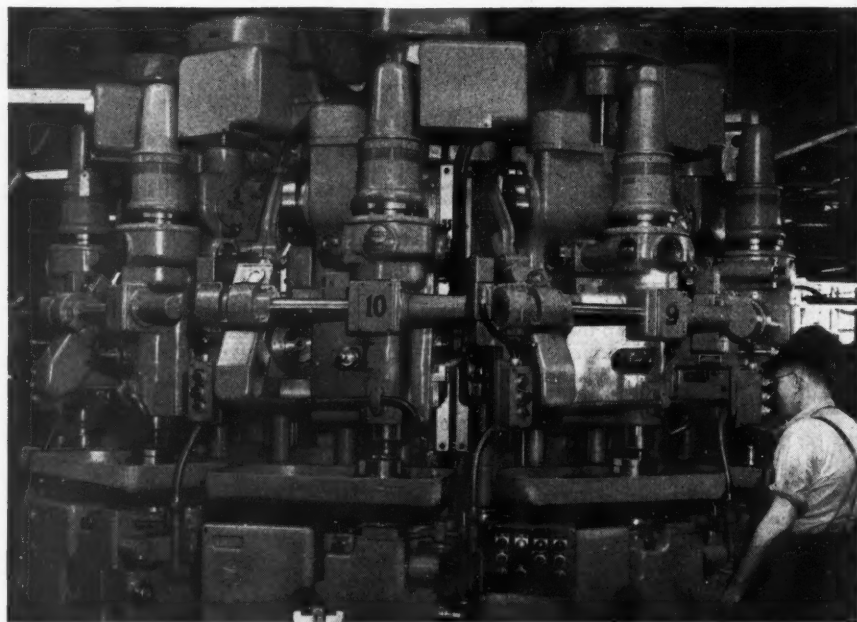


Fig. 1—View of Fellows No. 10 Rotary Gear Shaper cutting Internal Helical Gear for an automobile transmission

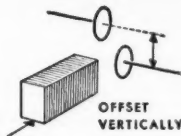
ANNOUNCING...



SPINDLES
OPPOSED



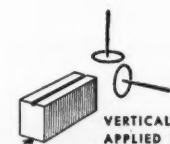
OFFSET
HORIZONTALLY



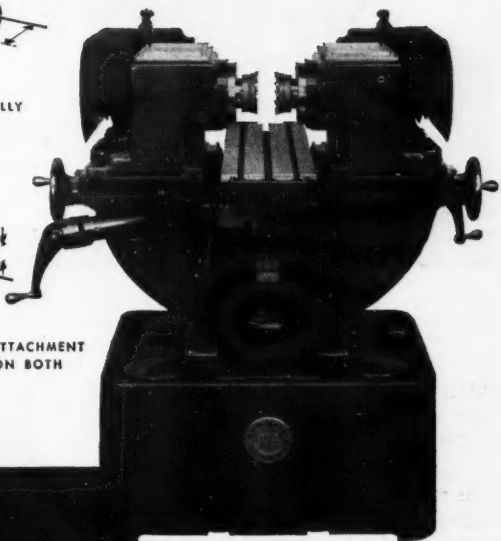
OFFSET
VERTICALLY



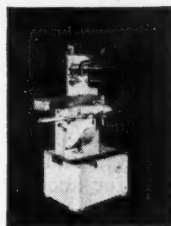
VERTICAL ATTACHMENT
MOUNTED ON BOTH
SPINDLES



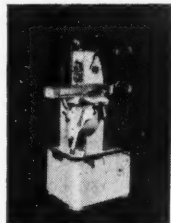
VERTICAL ATTACHMENT
APPLIED TO EITHER SPINDLE



THE *Nichols* TWIN MILLER



Also available are Nichols Two Spindle Hand Millers with identical or opposed spindles and with or without pneumatic feed.



For operations such as those diagrammed at the left, the Nichols Twin Miller offers exceptional economy with greatly increased output. Its rugged, precise construction combined with ample power is ideal for machining simultaneously two surfaces which must be held in accurate relation. The preloaded ball bearing spindles may be positioned horizontally, vertically, and crosswise, independently of each other. A solenoid operated air cylinder feeds the table automatically. Fifteen spindle speeds between 55 and 2080 rpm are available. Condensed specifications are listed below. For full details write Nichols-Morris today.

CONDENSED SPECIFICATIONS

Table, working surface.....	8 $\frac{1}{2}$ " x 30"
Table travel — cutting stroke.....	12"
Motors.....	1725 RPM AC reversible 1 HP
Maximum height center of spindle above table.....	12"
Maximum offset of spindles (horizontal).....	9"
Maximum distance between spindle noses (across table).....	16"
Overall Dimensions.....	4' x 5' x 4'7"

MANUFACTURED BY
W. H. NICHOLS COMPANY, WALTHAM, MASS.

NATIONAL DISTRIBUTORS NICHOLS-MORRIS CORP., 50-N CHURCH ST., NEW YORK 7, N.Y.



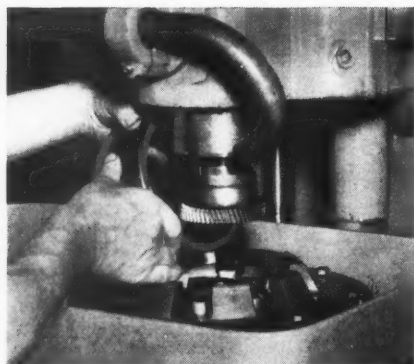


Fig. 2—Operator Removing finished Gear from Diaphragm Type Chuck. Note Cutter-spindle is at top of stroke to facilitate removal.

"units" are operating. In this manner production is not completely interrupted.

The cam on the base for operating the work-holding fixtures can be designed to suit the cutting cycle, or the time required for the turret to make one complete revolution. For instance, if the gear being cut can be finished, say in three minutes, the cycle time for the turret would be $3/9 \times 10$, or $3\frac{1}{3}$ minutes; therefore loading time would be $\frac{1}{3}$ minute or 20 seconds; this, of course, would include the interval necessary to unclamp and clamp the work.

Where necessary, especially when cutting internal gears, provision can

be made through combined electrical and mechanical means for stopping cutter reciprocation at the top of the stroke, so that the work can be quickly removed and inserted, without any extra effort on the part of the operator. This is an added operating convenience for increasing production.

The specifications on the gear as shown in Fig. 3, which is made from a fine grade of cast iron, are as follows:

Number of teeth	79
Diametrical pitch	16
Pitch diameter	5.1313
Pressure angle	20°
Helix angle	15° 47' 43"
Face width	1 $\frac{1}{4}$ inches

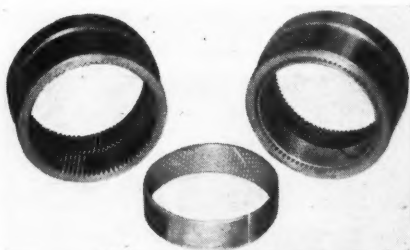
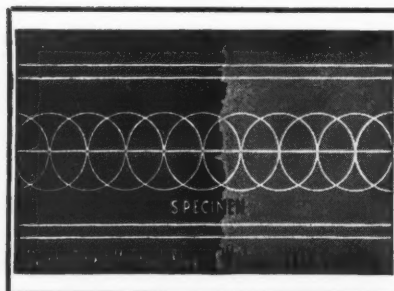


Fig. 3—Views of Internal Helical Transmission Gear. One row of teeth act as oil grooves.

It is finished in two cuts taken at the same work setting, and is machined to close limits for accuracy of tooth profile and spacing.



DYKEM STEEL BLUE

Stops Losses in Making Dies and Templates

Simply brush on, right at the bench; ready for the layout in a few minutes. The dark blue background makes the scribed lines show up in sharp relief, and at the same time prevents metal glare. Increases efficiency and accuracy.

Write for full information.

THE DYKEM COMPANY

2301F NORTH 11th ST.

ST. LOUIS, MO.

(In Canada: 2466 Dundas St., West, Toronto, Ont.)

YOU GET ALL THESE ADVANTAGES IN NICHOLSON ROTARIES HAND CUT AND MACHINE GROUND

STYLES A wide range of shapes and sizes from which to choose. Name almost any rough or delicate finishing operation and Nicholson will come up with a Rotary File or Bur that will save both time and money.

STEEL Nicholson regular Rotary Files and Burs are made from a special grade of high-speed steel, expertly hardened and carefully shaped.

CODE SYMBOLS The Nicholson system of identification makes for easy ordering. The first symbol identifies the style or shape of the head; second, the diameter of the head; third, the length of the head; and fourth, the coarseness of the cut.



CUTS Available in either Hand Cut (for use on tough, dense materials) or Ground-from-Solid (for non-ferrous metals). Expert hand-cutters form the teeth of Nicholson Rotary Files; precision machines grind the flutes of Nicholson Burs.

SHANKS Standard shanks are $\frac{1}{4}$ " in diameter. Nicholson also has a complete line of Rotary Files and Burs with $\frac{1}{8}$ " shanks. These "little fellows" are ideal for relatively delicate power filing.

TRADE-MARK The famous Nicholson trade-mark is your assurance of quality — of rotaries carefully shaped, centered, cut or ground and hardened. Available through your industrial distributor.

NICHOLSON FILE CO.
93 Acorn Street, Providence 1, R. I.
(In Canada, Port Hope, Ont.)

NICHOLSON ROTARY FILES

HAND CUT AND MACHINE GROUND

HIGH SPEED STEEL AND CARBIDE

Here's why you can grind for less

with the Sensational 32 ALUNDUM Grinding Wheel

BY an ingenious Norton-developed and patented process the grains of 32 ALUNDUM abrasive form in the electric furnace in a fluid matrix. This allows each grain to grow into a single, complete crystal—strong in shape and with many sharp points on all sides. Result: a faster and cooler cutting action.

And the matrix serves a dual purpose for it also absorbs the impurities present in the melt. Thus 32 ALUNDUM abrasive is over 99% pure fused alumina—more actual cutting material than in any other abrasive. Result: less dressing, longer wheel life.

By a complicated chemical process the matrix is dissolved away and the released grains are then washed and screened to size. No crushing is necessary.

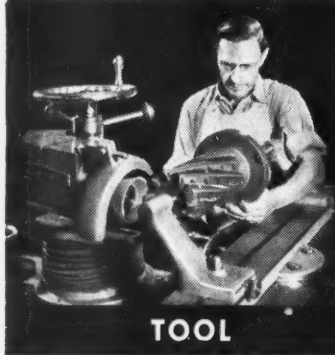
That this sharper, purer abrasive really cuts grinding costs is being demonstrated every day in thousands of plants.

Are you taking advantage of 32 ALUNDUM grinding wheels?

NORTON COMPANY, WORCESTER 6, MASS.

NEW YORK • DETROIT • CHICAGO • CLEVELAND • PITTSBURGH • PHILADELPHIA
HARTFORD • DENVER • LOS ANGELES • Distributors in all principal cities

Use "32" for these grinding Jobs



TOOL



INTERNAL



SURFACE

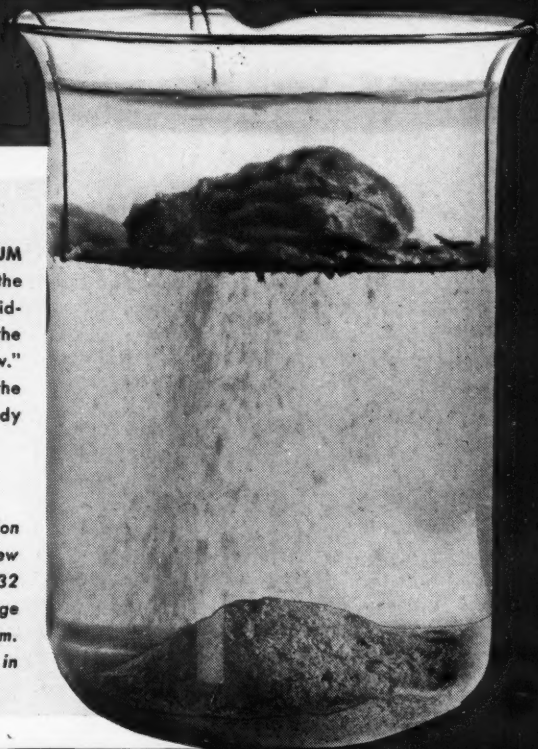
heel

A Demonstration

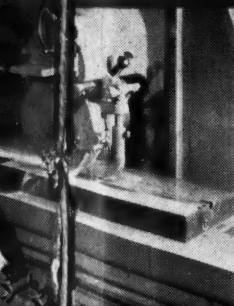
Here you see 32 ALUNDUM abrasive as it comes from the electric furnace—the individual crystals imbedded in the matrix in which they “grow.” As this matrix is dissolved the grains are released—ready for screening to size.

See It Yourself

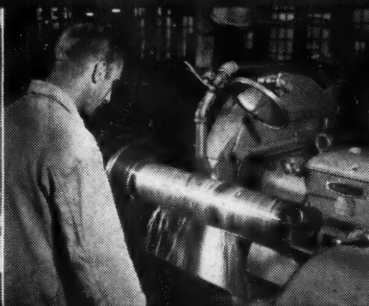
You'll find this demonstration and many more in the new Norton motion picture on 32 ALUNDUM abrasive. Arrange for a showing of this 16mm. Kodachrome sound film in your plant—no obligation.



NORTON ABRASIVES



SURFACE



CYLINDRICAL



CENTERLESS

Subject: FILES for DIE CASTING

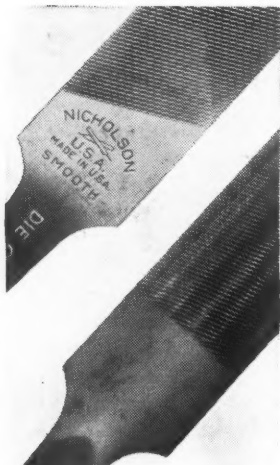
"KNOW YOUR FILES AND CUT COSTS"

• It's the cost of the work-
man's time that counts in
filing operations. Save these
advertisements.

Prepared by Nicholson File Co.



Mill Bastard Die Cast File



Half Round Die Cast File

FUNCTION OF DIE CAST FILES. Die castings of aluminum, magnesium or zinc alloy present special problems under which regular purpose files do not stand up as they should when removing webs, fins and flashing, or filing thin sections, sharp corners and edges. Regular purpose file teeth also have a tendency to clog up rapidly.

While Nicholson and Black Diamond Die Cast Files have the same number of teeth per inch as the regular Mill Bastard file, their teeth are specially shaped and sharpened to cut fast and without excessive clogging. Die Cast file teeth are also made extra strong on sides and edges to prevent their "shelling off" or "breaking out" under severe use against obstinate fins, corners or other projections.

POPULAR TYPES OF DIE CAST FILES. The Nicholson or Black Diamond Mill Bastard Die Cast File is single cut. The Half Round is double cut on its rounded side as well as on its flat side, thus permitting comparatively fast stock removal. But since it is made in Smooth instead of Bastard cut, it also produces a good finish.

HOW TO USE DIE CAST FILES. Light to medium pressure should be applied in filing small die castings; medium to heavy on large ones. A right-toward-left stroke generally should be used.

IDENTIFICATION AND SIZES. Nicholson and Black Diamond Die Cast Files are stamped "Die Cast" on tang. Regularly furnished in Mill Bastard and Half Round in 6", 8", 10", 12" and 14" lengths through your industrial distributor.

FREE 48-PAGE BOOK, "FILE PHILOSOPHY," tells about many special-purpose files and includes valuable information about files in general. **SEND FOR IT.**



NICHOLSON FILE COMPANY

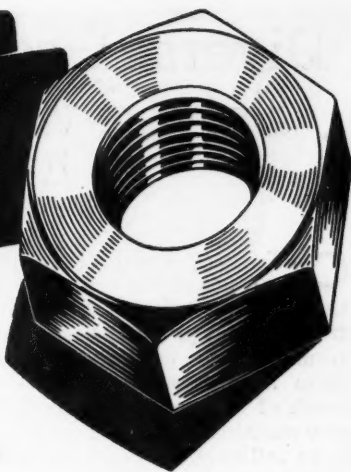
48 Acorn St., Providence 1, R. I.

(In Canada, Port Hope, Ont.)



NICHOLSON FILES FOR EVERY PURPOSE

**HERE'S
HOW...**



HY-PRO ENGINEERING
increased production from
1,000 pieces per tap to 12,000 pieces per tap

PART: Check nut for air-conditioning fan blade.

PROBLEM: Stringy consistency of 1020 steel caused the 3 and 4 flute taps to pick up and seize often breaking the tap on the 1st or 2nd piece. Production never exceeded 1,000 pieces per tap. Did the Hy-Pro Sales Engineer think it possible to design a tap that would increase output per tap?

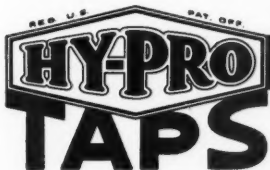
HY-PRO SOLUTION: Samples sent to the Hy-Pro Engineering Department were studied and tested. They suggested using a two flute spiral point tap with a special Hy-Pro finish. Manufacturer reports average production per tap now exceeds 12,000 pieces.

Above is a typical example of how the Hy-Pro Sales Engineer can help increase threaded-hole production. His expert engineering counsel backed by the most up-to-date tap production methods combine to solve tapping problems rapidly and profitably.

Let Hy-Pro solve your tapping problem — call a Hy-Pro Sales Engineer today.



Order from your Distributor



HY-PRO TOOL CO.

NEW BEDFORD, MASSACHUSETTS

A SUBSIDIARY OF CONTINENTAL SCREW COMPANY

Diverse Production Problems Solved with Multi-Spindle Automatics

COST-CONSCIOUS executives are wearing out a good many pencils these days, figuring how to wrest control of their production expenditures from the grip of inflation. Three of them have experience to show that much of the answer can be found in new machine tools, designed specifically to roll back cost factors that have gotten out of hand. The range of production to which a single new design can be applied for that purpose is represented in the widely different problems, confronted separately, by each of three New Jersey manufacturers.

The Hopewell Division of the Rockwell Manufacturing Company was being converted from a feeder plant to the production of end items. From making small parts for registers and

other recording devices used by gas companies, it was up to Division Manager Herbert S. Rockwell to take over production of these entire items, plus valves and similar precision fittings.

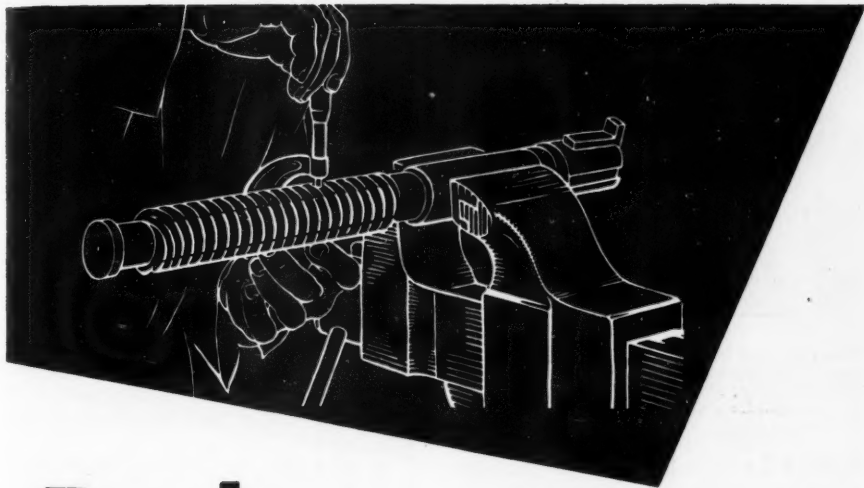
Single spindle automatics, on which he had depended, were a little short of the capacity needed. Yet most larger equipment was equally out of range.

An entirely different problem confronted C. L. Ritchie, vice president and general manager of the Orange Roller Bearing Company, Inc. The products of that industry still sell at about the 1936 price level. But wages alone are up 115 per cent and material costs have risen 45 per cent. Additionally, such items as diamond cutters have tripled and even quadrupled.

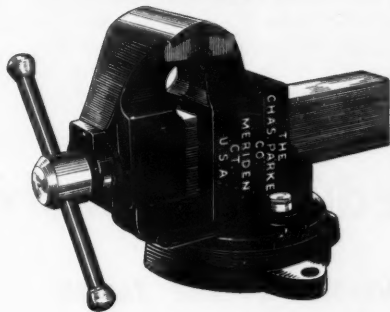
According to Ritchie, such inflated



View of two Warner & Swasey 5-Spindle Automatic Bar Machines installed in the Hopewell Division, Rockwell Mfg. Co. plant.



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...and it's a bear for action on production, maintenance and repair jobs, too! The 360° swivel base, brake-type locking, swings the work to *any* handy point—the renewable steel jaws cover *entire* top of vise—the solid-cast un-

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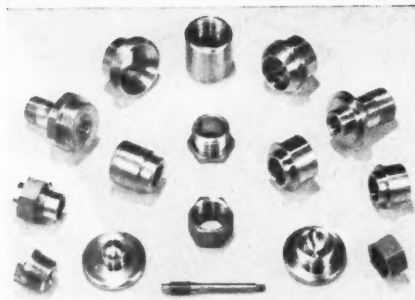


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PARKER VISES

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These parts of 18-8, MO, and D20 stainless steel are being machined at Alloy Steel Products, Inc. of Linden, N. J. on a Warner and Swasey 5-spindle Automatic Bar Machine.

factors have raised the break-even point on volume to at least double that of pre-war days. The cost of carrying an excess inventory could wipe out profits. Yet long runs were essential for economical results on the type of

multi-spindle automatics with which the plant was equipped.

Again in contrast was the problem that faced J. H. Davis, president of the Alloy Steel Products Company. His production, limited to short runs, was accomplished on turret lathes. More volume was needed, but the plant lacked room for more lathes and the cost of expansion was prohibitive.

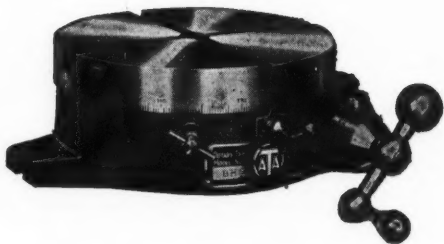
"A run of 500 parts might constitute a year's supply of any one of the large number of types, sizes and models, that often are 'tailor-made' to customer's specifications," he said, "and the duplication of special tooling for subletting such jobs simply prorated to a 'dead end.'"

Beyond the immediate solution of these three diverse problems, the executives of each concern sought to equip their plants, not only for the current swing from a seller's to a buyer's market, but for a future competitive

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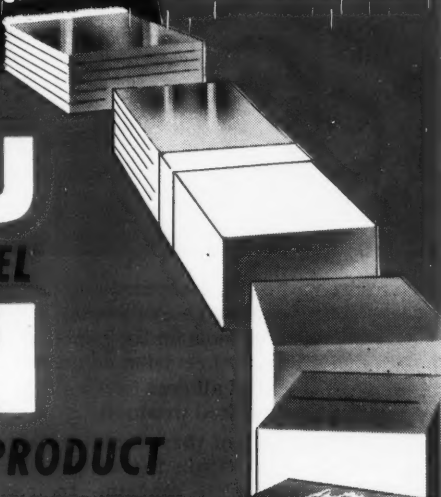
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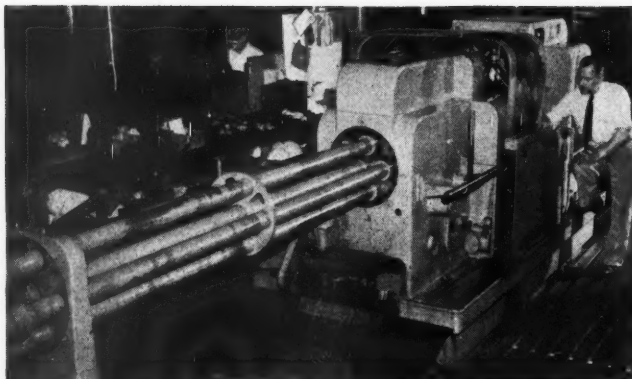
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Warner & Swasey 5-Spindle Automatic Bar Machine installed in plant of Alloy Steel Products, Inc., Linden, N. J.

advantage within their separate industries. That meant a re-evaluation of available machine tools on the basis of how much downward revision could be made in the total of all cost factors involved in their finished products.

Ultimately, each of them found their requirements fell within the range of production for which machine tools had not been specifically designed until the Warner & Swasey Company brought out its five-spindle automatic.

In enumerating his savings in machine and man hours, capital outlay, floor area and investment in new equipment, Division Manager Rockwell of the Hopewell Division cites the following data:

"Two five-spindle automatics have a capacity in excess of 10 single spindle machines. The two new units are hand-

averaged $2\frac{1}{2}$ operators and one set-up man, plus inspection time.

"The floor space saved is represented in the requirement for the two five-spindle machines of 240 square feet, as compared with 572 square feet for 10 single spindles, or a saving of 332 square feet. Thereby the related costs of maintenance, heating, lighting and air conditioning could be proportionately reduced.

"As against 10 motors of $7\frac{1}{2}$ horsepower each, to power the single spindle units, one 15 horsepower motor for each of the new units is ample, which allows a reduction in electric bills equivalent to 45 horsepower. In capital outlay, the two new multi-spindle units cost \$32,250, as against a cost of \$57,500 had the 10 single spindle units been duplicated."

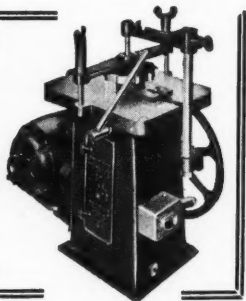
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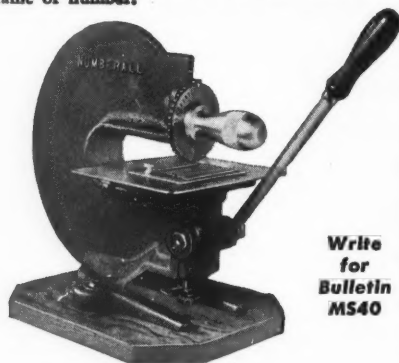
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Model
50



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Nor does the saving end there, according to Rockwell. Comparative down-time for setups was cut to one-quarter of the former requirements. And the costs of several secondary operations, which, of course, involved more rehandling and storage floor space, have been eliminated.

As an example, he pointed out that one of the new units has taken over, as part of its operating sequence, the work formerly done on two double-spindle drill presses, one double-end key lathe and one precision threading and tapping machine.

Elaborating on how this subsidiary saving was accomplished, Rockwell explained that "on one of the new machines we rough and finish the bore on the taper of a $\frac{3}{4}$ -inch body valve and bore and tap for bottom cover at the rate of 100 pieces per hour with one operator.

"Formerly, it was necessary to snag ream and rough ream these pieces on a two-spindle vertical drill press with one operator, who finished 140 pieces an hour.

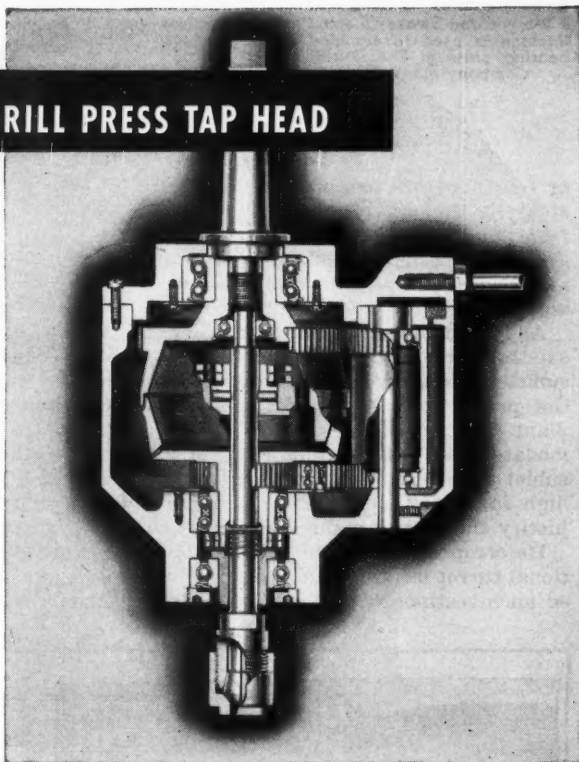
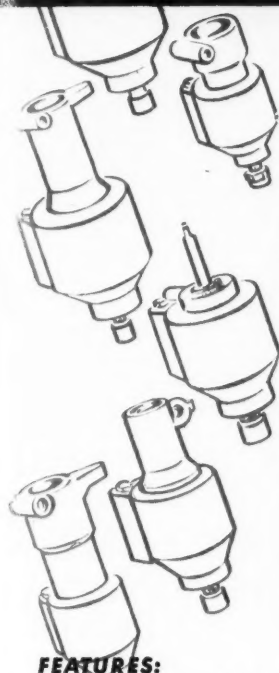
"The piece was then moved to a second machine, where it was bored and tapped for bottom cover by a second operator, at the rate of 150 pieces per hour. Again the work had to be moved to a third machine for finish reaming by a third operator at the rate of 128 pieces per hour.

"In contrast, this finish reaming now is done on the five-spindle automatic with a single point tool. The use of this tool alone has eliminated thousands of dollars formerly required for the replacement of reamers, as well as the cost of sharpening them," Rockwell stated.

The Alloy Steel Products Company affords a case in distinct contrast. The kind of production there belongs, traditionally, to the turret lathe.

All told, there were 69 jobs, of 500 down to 200 pieces, in regular production. A run of 500 might include three

SNOW DRILL PRESS TAP HEAD



FEATURES:

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Engineers and mechanics will recognize the rigid, sturdy construction; and operators will vouch for length of service, ease of operation, and quality of work produced.

Eighteen years of production testing, and thousands of installations have proven the advantages of using a precision built drill press tap head.

These units are available in three sizes—0 through 1/4"; No. 6 through 3/8"; and No. 10 through 1/2"—both Morse taper and quill clamp styles are in stock.



SNOW MANUFACTURING COMPANY

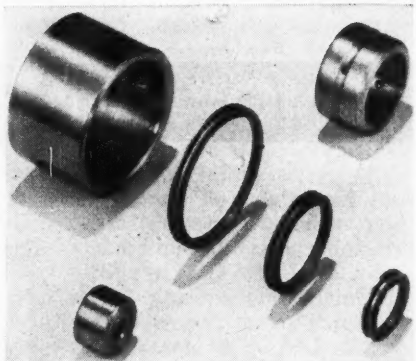
443 EASTERN AVE., BELLWOOD, ILL. • SUBURB OF CHICAGO

A Warner and Swasey 5-spindle Automatic Bar Machine is used to machine these precision bearing parts at The Orange Roller Bearing Company plant, Orange, New Jersey.

or four separate loadings of different stock for the production of valve parts from stainless steel, nickel, monel, aluminum, bronze and the like. One or two setups daily on each machine was the general rule.

As President J. H. Davis pointed out, existing turret lathe equipment hadn't sufficient capacity to accommodate all the production needed, nor had the plant sufficient floor space to accommodate much added equipment. Yet to sublet the jobs meant running up a high inventory overhead, in order to justify the cost of duplicate tooling.

He computed that adding five additional turret lathes would have required an investment about equal to that



of adding one five-spindle automatic with special tooling. A second automatic could be added for about half the cost of the first, because the special tooling would be interchangeable.

But a saving of close to \$10,000 was represented in acquisition of the automatic, as compared with five turret lathes, mainly because of the cost of

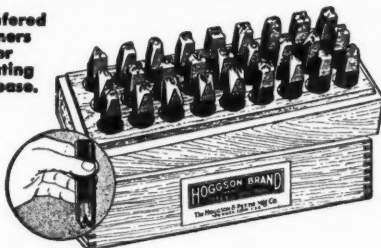


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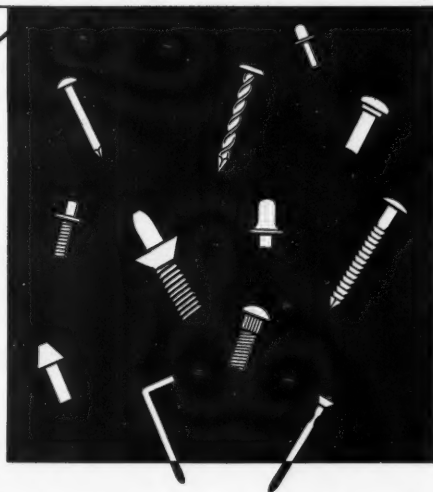
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plant expansion to accommodate the latter. Following along this same line, Davis stated it would be possible to expand his plant by 50 per cent of its capacity, without adding new floor space, by simply replacing turret lathes with the new automatics.

He was reluctant to acquire automatic equipment on the assumption that a tooling department for production of special cams for each job would be necessary. Cost of the latter, plus excessive down-time during changeovers, would necessitate the long runs he was trying to avoid.

That problem became non-existent with the new five-spindle automatic, on which cams have been replaced by easily adjusted quadrants that are quickly set by the operator.

By laying out production at the Alloy Steel Products Company in a sequence of consecutive jobs insofar as possible, Works Manager A. P. Nel-

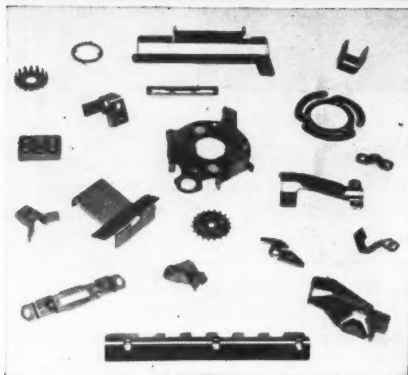
son finds the average setup time on the new automatic is about 3½ hours.

Furthermore, no setup man is needed. A single operator keeps the machine busy and turns out as much production as could have been obtained from five turret lathes, at the same time doing his own inspection. Meanwhile, the better speed selection on the multi-spindle makes for better quality and finish of the work.

A large amount of internal and external threading is required. Taps are operated at a maximum of 15 surface feet per minute and tap life is found to be about 550 to 575 holes on taper pipe threads requiring 95 per cent of full-thread depth.

For the most part, turning is done at from 85 to 205 surface feet per minute. Such high alloy stock, Nelson points out, does not lap or grind well, because the abrasive wheel tends to load up. For that reason the turned

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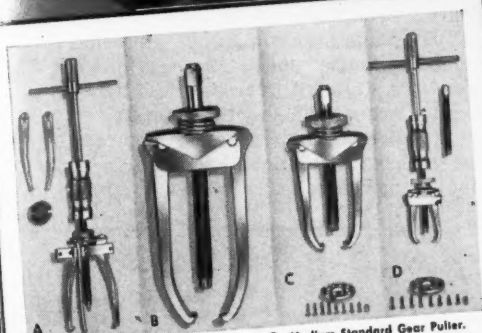
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International Division, Kenosha, Wisconsin, U. S. A.

October, 1948



finish accomplished by the five-spindle automatic has to equal a ground finish.

As Davis summed up the advantages, the multi-spindle pays for itself in two years on a one shift basis, as employed on the work at Alloy Steel Products Company. The total of all cost factors entering into production there, including the cost of high alloy stock, has been cut in half as compared with other alternatives.

It was the flexibility of the five-spindle automatic, as a unit to handle the job runs a little too short for conventional automatic economy, that made it the solution to the problem of reducing inventory at the Orange Roller Bearing Company.


Other automatic equipment in use there includes three six-spindle machines and eight four-spindle units, all of conventional type. Under present circumstances, a month's run on any of the equipment would be unusual.

Ordinarily a change would be encountered every three or four days, with average runs amounting to three or four thousand pieces.

A high cost factor in production was represented in down-time. Often, four or five units of equipment would be undergoing setup simultaneously. Additional cost resulted from inefficient operation of cam controlled equipment, because a change of cams on such units as the six-spindles was not made in preparation for shorter runs.

When the new five-spindle automatic was added, efficiency went up and costs went down, because the change-over from one job to the next could be made much faster. A provision for automatic speed change on the new equipment overcame the lack of operating efficiency that resulted from failure to change cams. And, finally, the cost of a special setup man no longer has to be prorated over each run.

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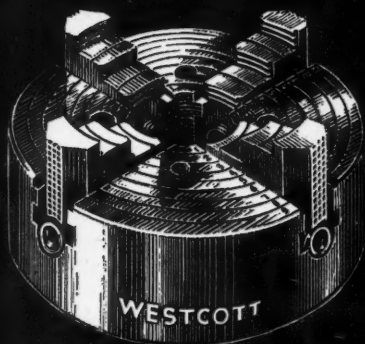
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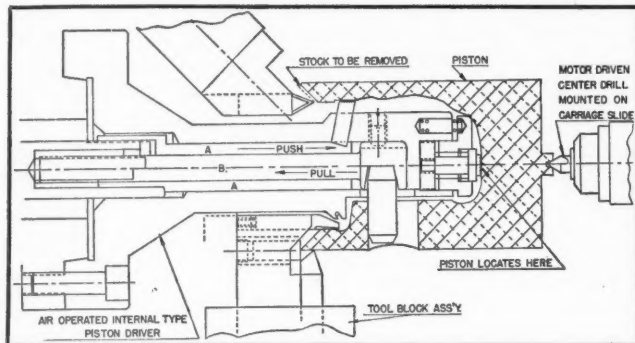


Fig. 1—Detail drawing of air operated expanding arbor

ated with expander push rod A. The piston is held back against the centering plate by a pin inserted

THE accompanying tool layout Fig. 1 shows the details of an air operated expanding arbor which is designed for use in conjunction with a Seneca Falls Model "LR" Automatic Lo-Swing Lathe in the machining of alloy pistons.

The centering operation is of particular importance as the piston has to be centered true with the rough bore of the piston in order to maintain accurate wall thickness. The design of the air operated Centering Arbor is shown on the layout and it will be noted that the end of the arbor is fitted with a spring loaded centering plate which centers the piston true with the radius in the bottom of the bore.

The open or skirt end is centered with three expanding jaws which are oper-

ated through the gudgeon pin hole, and operated by pull rod B which passes through the push rod A. The push-pull action on the pull rods is obtained with a single air cylinder which "floats" on the headstock spindle, the "push" action being obtained with the air cylinder body, while the "pull" action is transmitted by the air cylinder piston.

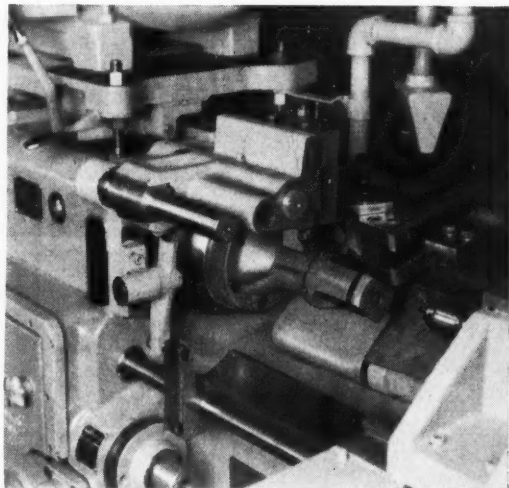


Fig. 2—Front view of air operated loading fixture

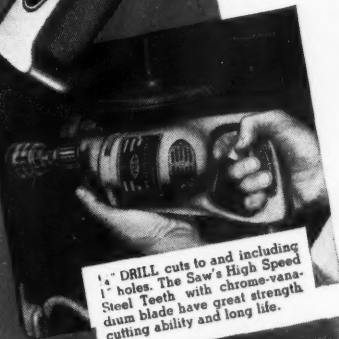
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$\frac{1}{4}$ " DRILL cuts to and including
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The machining operations are as follows: The piston is centered on the closed end with a combination center drill mounted in an electrically operated centering head fixed to the front carriage, which in turn is operated by the longitudinal feed cam. The open end of the skirt is bored and faced and the outside diameter is turned a short distance with three tools mounted in a

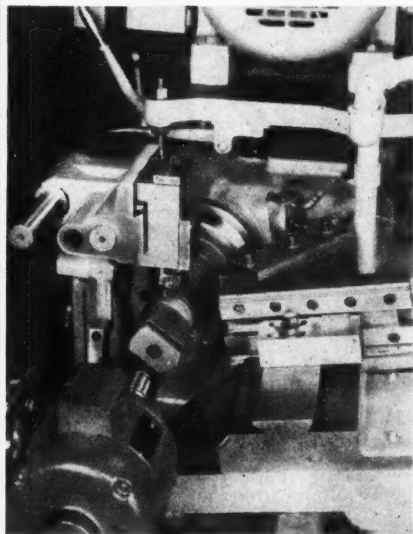


Fig. 3—Overhead view of air operated loading fixture

special overhead attachment clearly shown in the accompanying illustration Figs. 2 and 3. The large 45-deg. chamfer on the bore of the piston is machined with a special squaring attachment mounted on the back ways of the lathe. This chamfer is important, has to be free from chatter marks and, consequently, could not be made with a formed tool.

All of the above operations proceed simultaneously and a production of 127 pistons per hour is obtained per machine with tungsten carbide tools.

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Seventy-Five Per Cent More Production on Automatic Lathe

FIGURE 1 shows a view of two

Lodge & Shipley 2A Duomatic (automatic) Lathes, which are now being used by The J. I. Case Company, noted farm equipment manufacturers, at their Bettendorf, Iowa, plant. In producing $1\frac{1}{2}$ -inch diameter snapping roll shafts for Case's famous corn picker, two Duomatics are used. Operated by one man, these automatic lathes turn and face cold rolled bar stock to 0.002 tolerance at a production rate 75 per cent greater than former lathes. Carbide and high speed steel tool bits are used for this type work.

As its name implies, the 2A Duomatic is really two lathes in one. Two tool carriages operate singly or simultaneously. With two multiple tool set-

ups working, production may increase double or more. There are no expensive time-consuming cams to change on the Duomatic. Jobs are set up and run in minimum time.

This modern machining marvel takes over from the moment the operator loads the workpiece. Complex parts are actually duplicated without further attention from the operator, no matter how complex the job, performing any combination of straight, or angular "in and out" turning and facing operations. The 2A is so completely automatic even unskilled workers handle complex multiple tool jobs with ease. This machine is also available in a larger model, the 3A Duomatic, for heavier work.

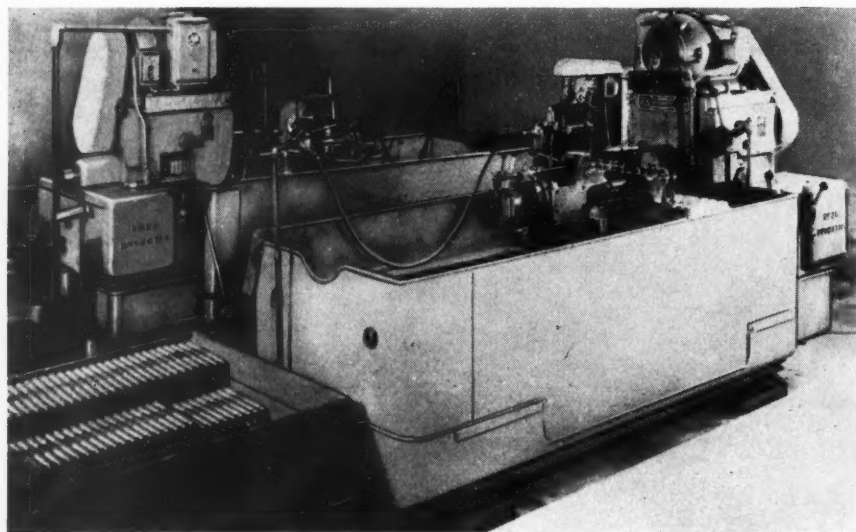
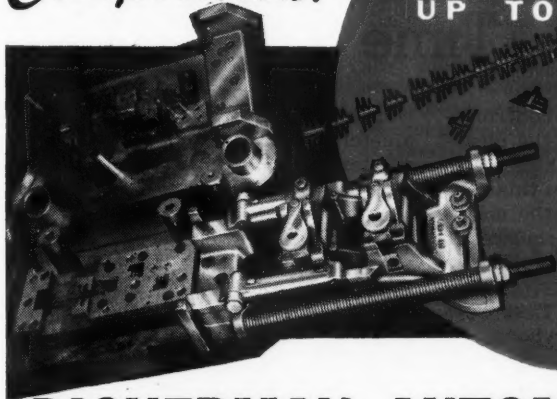


Fig. 1—View of two Lodge & Shipley 2A Duomatic Lathes installed in farm equipment manufacturing plant

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**REDUCE
OPERATOR
HOURS
UP TO**

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THE outboard motor has contributed a great deal toward the pleasure of fishing. Gisholt Machine Company has carried its share in this contribution by solving one of the major production problems facing this growing industry. The following story is but a small part of the old American story—More Production at Less Cost means More Things for Everybody.

The crankshaft of an outboard motor is part of an exceptionally compact and efficient unit. Restricted in length by the designers, the production men are faced with the problem of machining the adjacent cheeks for each bearing.

Ordinarily in the preparation of a crankshaft for grinding, a variety of machines and operations are required. The cheeks of the throws must first be roughed out in order to provide

working-room for turning the pin diameters. In many cases these pin diameters must be both rough and finish turned. Finally, the cheeks must be adequately faced in order to provide proper clearance for the operating assembly. Multiply this sequence of operations by the number of individual pin bearings and you can begin to realize the complexity of the machining problem.

The Gisholt Turn Mill shown in Fig. 1 has been designed to combine all of these operations into one. The crankshaft forging comes to the machine with both ends already turned, as is necessary under the former method. However, it now leaves the machine ready for grinding. Figure 2 shows a view of both the single and two-throw type crankshafts as they appear before and after turn milling. Note the solid

counterweight on the single throw crank. Nearly one-fourth of the total weight must be removed in a single operation.

As a crankshaft comes to the turn mill it is inserted between driving

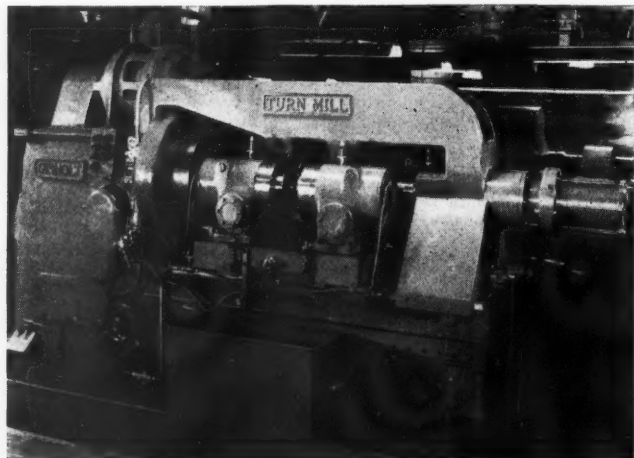
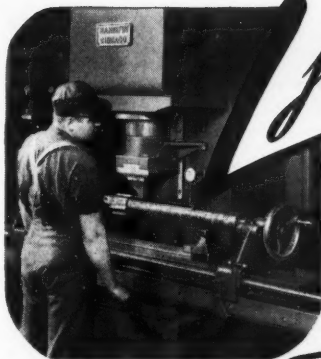


Fig. 1—Model TMS-1 Crankshaft Turn Mill



Job tested!

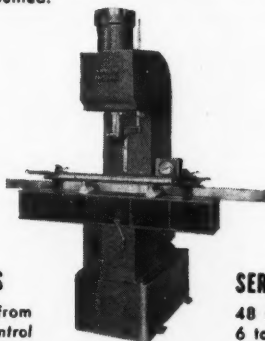
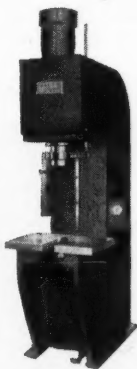
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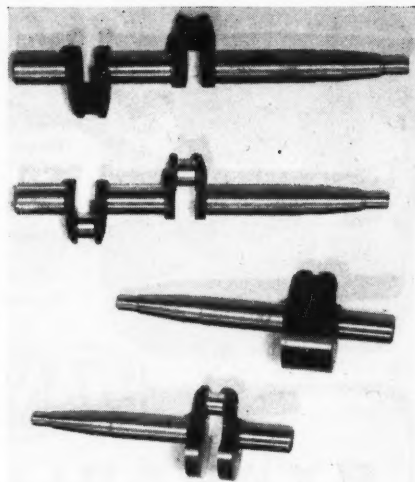
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Fig. 2—Views of both the single and two-throw crankshafts, showing before and after Turn Milling.

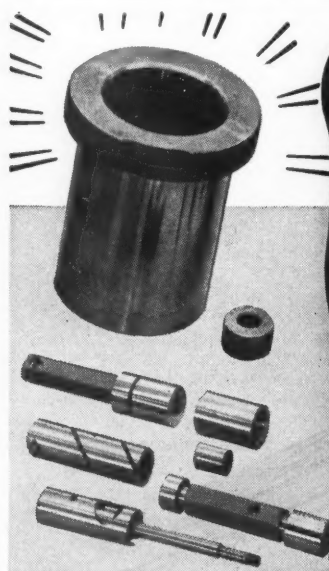
heads. These heads are positioned on a slide. When the operator pushes the "start" button the slide feeds into the milling cutter to the pin diameter grinding tolerance. The crankshaft is then rotated a full revolution around the axis of the pin, after which the cutter stops, the slide retracts and the piece is unloaded.

Figure 3 shows the single throw crankshaft in operating position. The left driving head is open to show the method of holding. The floor-to-floor machining time is 55 seconds.

Figure 4 shows the two throw crankshafts in operating position. The first



throw is handled on this machine in the same manner as the single throw crankshaft. When the first throw bear-



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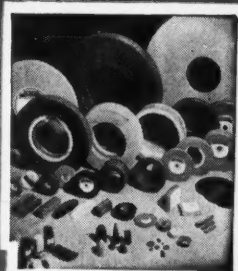
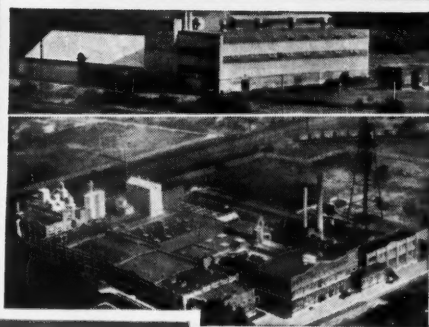
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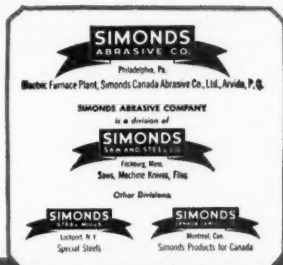
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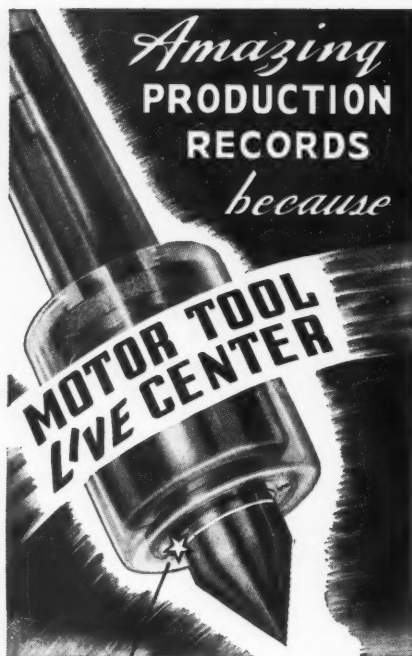
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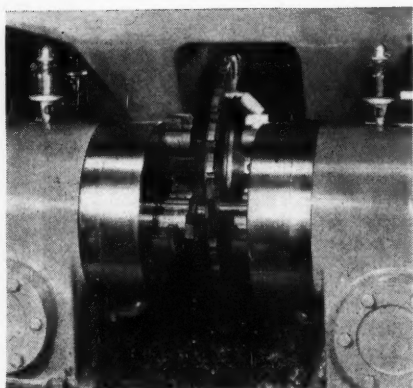
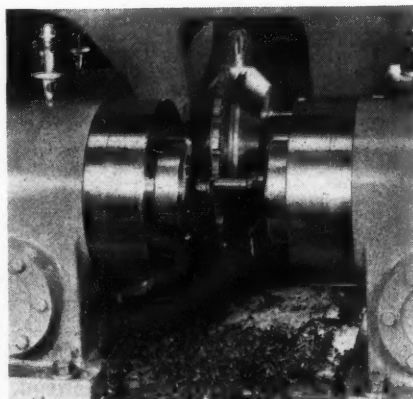


Fig. 3—Closeup of cutter and single throw crankshaft

ing is completed the crankshaft is removed, turned end for end and replaced in the machine. The operation is then repeated for the second throw bearing. The total floor-to-floor machining time for both throw bearings is $1\frac{1}{4}$ minutes.

It is the opinion of the outboard motor manufacturer that the Gisholt Turn Mill does its work in one-fourth or less of the previously required time.

Fig. 4—Closeup of cutter and two-throw crankshaft

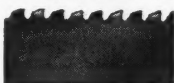


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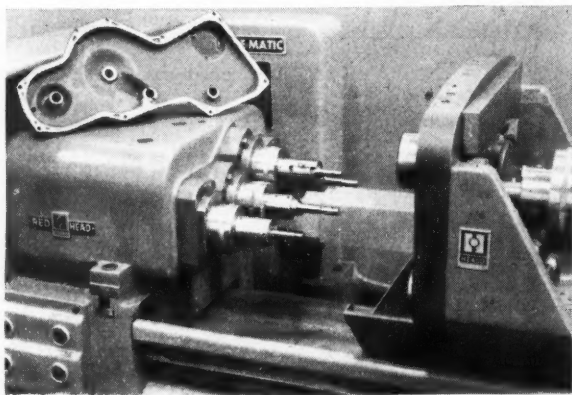
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Gear Case Production Increased 170 Per Cent

A LEADING manufacturer of washing machines now bores, faces and chamfers gear cases in a single setting with outstanding results. The new Heald Model 222 Bore-Matic which accomplishes this job has boosted production 170 per cent and lowered costs 63 per cent. This double end machine has a cluster head arrangement of four spindles on the left-hand end, as shown in Fig. 1, while a single head on the right end completes the boring head equipment. The fixture is an angle plate type with round and two-way pin location clamped by six hydraulically operated pull-back fingers.

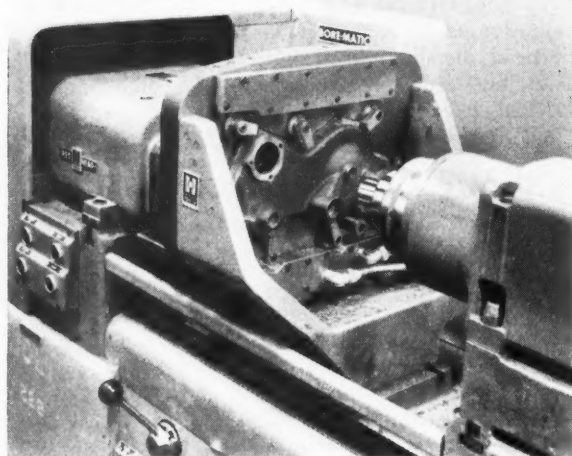
Once the fixture has been loaded as shown in Fig. 2 and the starting

button pressed the operating cycle is completely automatic. The table rapid traverses to the left where four holes are bored and chamfered and adjacent faces finished; the table then rapid traverses to the right-hand end for the single spindle operation; table rapid traverses to center stop for reloading.



(Above)

Fig. 1—View of cluster head for boring, chamfering and facing five holes simultaneously in workpiece shown.



(Left)

Fig. 2—Workpiece clamped in position on fixture. Five holes are bored, chamfered and faced simultaneously.

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Milling 500 Slots per Hour

THE Barber-Colman Interlocking Side Mills shown in the accompanying illustration Fig. 1 are now being used in the slotting of the cast iron yarn supports shown in Fig. 2 at the rate of 500 per hour under the following extraordinary conditions:

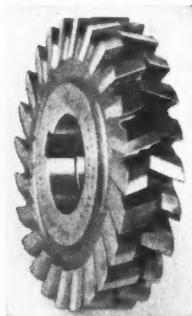


Fig. 1 — Barber-Colman Interlocking Side Mill Cutter

1. Magnetized chips cling to the cutter and machine surface, causing extra cutter abrasion.
2. Corners of slot must be sharp.
3. Width of slot must be held to very close tolerance.

The old method consisted of milling six pieces at a time on a conventional milling fixture with ordinary slotting cutters. Pressure had to be applied by clamps in 13 places to hold the six pieces firmly. It was difficult to set



Fig. 2—Cast iron yarn supports

the clamps satisfactorily because of the small size of the castings. In addition, tool cost was excessive because standard slotting cutters became undersize after only a few sharpenings. Production was 100 pieces per hour, and the cutters had to be sharpened after every 1,700 pieces.

As the parts were rough-ground on the bases, it was possible to substitute magnetic holding for mechanical clamping. By climb-cutting to exert a downward pressure on the parts, it was found that magnetic holding power was sufficient to firmly hold the pieces in place, with no vibration



Fig. 3—Setup for milling 23 cast iron yarn supports per load on magnetic chuck

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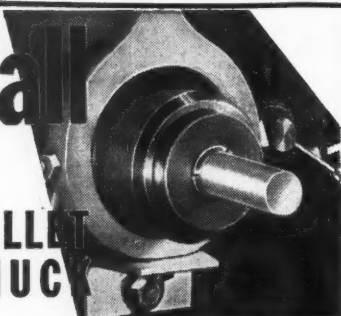
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during the cut. Twenty-three parts could be milled at a time, held against locating stops at one end of the magnet. Set-up and loading time were cut to only a fraction of the former time.

The Barber-Colman Interlocking Side Mills operate at 250 surface feet per minute and 14 inches feed per minute. Despite this high rate of metal removal and the abrasive action caused by clinging magnetic chips, these cutters are producing 3,300 pieces between sharpenings. The Interlocking Cutters are sharpened until the cutting teeth are completely expended because their width dimension can be increased after each sharpening by merely inserting a shim between the two halves. Another cutter feature which helped to solve this milling problem is the Herringbone Tooth Design. The angular gashes produce a shearing action in cutting, hence a better finish, with less chance for vibration at high feeds and speeds.

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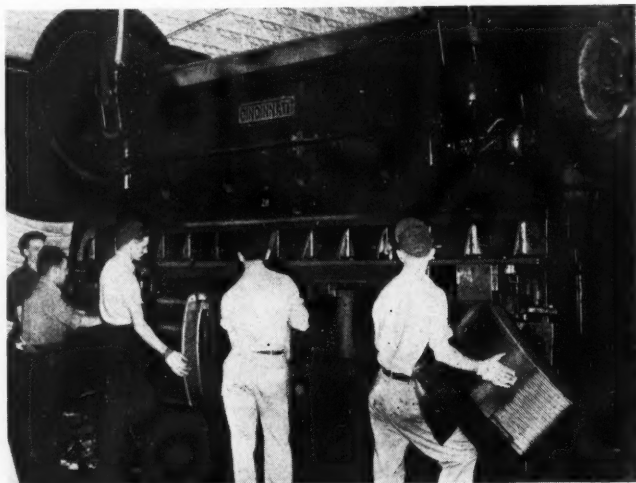
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Seven Operations Performed Simultaneously

THE accompanying illustrations Fig. 1 and Fig. 2 show a Cincinnati Shaper Company Press Brake which is designed for use in the fabrication of refrigerator cabinets. Seven men are working on this machine as shown in the front and back views. This principle of passing a part from one man to another while a sequence of operations are performed is rapidly becoming popular in the press field. Sometimes called multiple operation, the principle employed is simply the application of a succession of dies fitted to the same machine. The extra length of the modern press brake allows several such dies to be arranged in this manner.

The advantages from multiple operations are many. A single machine replaces several other machines, resulting in a lowering of capital investment and required floor space. There is no stacking of parts between operations requiring valuable floor space. The part is completed by passing from hand to hand and can then be moved immediately to assembly or other operations

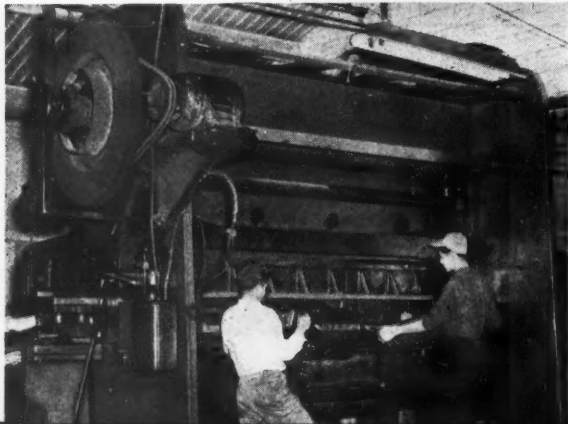


(Above)

Fig. 1 — Front View of Cincinnati Press Brake designed for use in the manufacture of refrigerator cabinets.

(Left)

Fig. 2 — Rear View of Cincinnati Press Brake designed for use in the manufacture of refrigerator cabinets.



such as painting or polishing. The parts are not marked or bent in moving from one machine to another, thus reducing the number of spoiled parts.

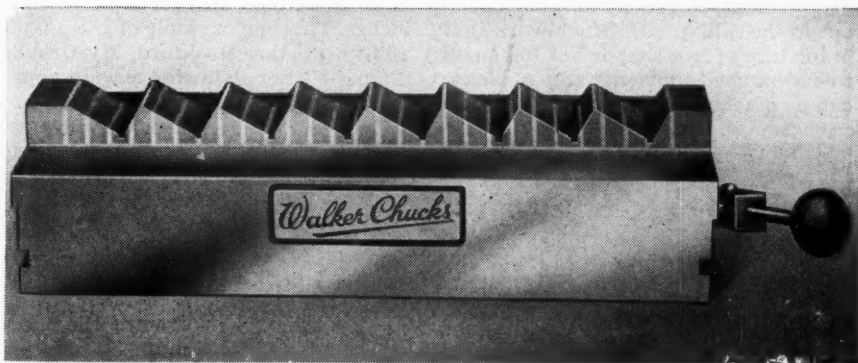
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THE Rockford Hy-Draulic Shaper-Planer is a distinctive type of machine tool which combines the speed of a shaper with the accuracy and convenience of a planer. Its openside construction adds to its productive capacity and ability to pay for itself quickly by handling most economically a wide variety of work, some of which would be otherwise costly to machine. The Rockford Hy-Draulic Shaper-Planer handles with ease many kinds of work that would tax the capacity of large shapers owing to the fact that when making long strokes the shaper ram has a tendency to deflect under the pressure of heavy cuts. This tendency increases greatly as wear develops in the ram guides. Much work that is too large for a shaper but too small to be handled efficiently on a planer can be machined speedily and econom-

ically on the shaper-planer.

The Rockford Hy-Draulic Shaper-Planer is one of the first machine tools in which the use of hydraulic pressure for driving the table is employed. The feeds, of course, as well as the table are driven by means of oil which is under heavy pressure.

Machining a copper core of a resistance welder in the plant of a large manufacturer of welding equipment, as shown in Fig. 1, is a most unusual job and demonstrates the smooth flow of Hy-Draulic power drive. The finish obtained on this work with the Rockford Hy-Draulic Shaper-Planer is a surface that checks precision flat within a tolerance measured in micro-inches. This one example of the adaptability of the Rockford Hy-Draulic Shaper-Planer indicates a wide application for this type of machine on jobs

which require accurate machining in a minimum amount of time.

The Shaper-Planer is designed and engineered in a manner which assures the maximum in dependable, trouble-free operation.

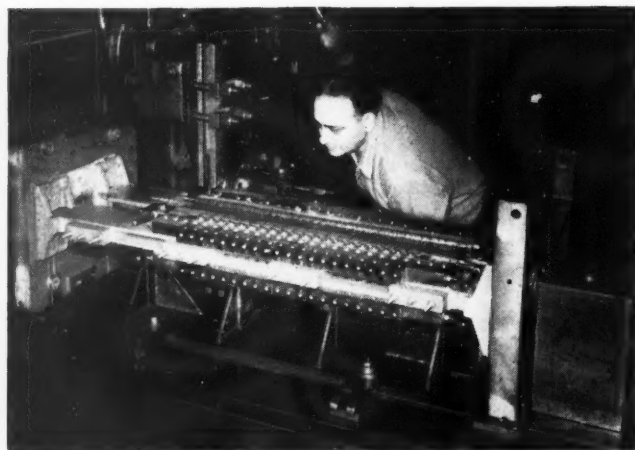


Fig. 1—View Showing Rockford Hy-Draulic Shaper-Planer Machining a Copper Core of a Resistance Welder

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With the machine set for automatic operation, from 200 to 300 rods are Microhoned per hour. Tests have disclosed that two of these machines will out-produce, both in quality and quantity, five grinders or four old-style single-spindle honing machines. The bore that rotates on the crankshaft is made straight, round and to size within 0.0003 inch.

The soft metal-faced sleeve, that forms the bearing surface between the rod and crankshaft, must be backed up by a surface that gives it full support

so the load is evenly distributed over its entire area. The finishing of this surface with modern Microhoning equipment assures that the rods will give the best possible service.

The operator only loads and unloads the rods in the fixtures. The fixtures allow the rods to float and align themselves with the tools. As the rods are Microhoned to the desired size, the Microsize unit ends the cycle by withdrawing the tools and indexing the fixture. As the next rods are positioned under the spindles the next cycle is started automatically.

Any type or degree of surface finish may be generated and duplicated with Microhoning to provide for the mating of the rod and the bearing sleeve and the dissipation of the heat generated in the bearing.

Through the use of the Micromatic Hydrohoner equipped with Microsize, the high production of finer and more accurately machined automobile parts is assured. To this may be added the substantial reduction in work handling which the automatic feature of this machine provides.



Illustration showing Micromatic Hydrohoner in operation

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- Any intelligent man can operate furnace with automatic temperature control, using established procedures.
- Operating cost under 4¢ per hour to hold 1600° F. in Model 3 furnaces, with 2¢ per kw.-hr. rate. Others in proportion.

NOW YOU CAN heat treat, harden and temper small parts in your own plant . . . without experienced heat treaters. Economical to install and use, Cooley Electric Furnaces operate efficiently at high or low heats, and save your large furnace time for work requiring large volume capacity. Here are some profitable uses:

PRODUCTION HEAT TREATING of small parts . . . Small batches . . . Running pilot lots to pre-determine mass production techniques . . . Emergency repairs . . . Industrial and laboratory testing . . . Miscellaneous controlled heating jobs.



CHAMBER	8"W 6"H 14"L				10"W 6"H 18"L				8"W 6"H 14"L	
MAX. TEMP.	1850° F.				1850° F.				2000° F.	
AMPERES	14.8 at 230 v.				19.6 at 230 v.				20.2 at 230 v. C	
WATTS	3400				4500				4650	
MODEL*	MH-3	VH-3	MK-3	VK-3	MH-4	VH-4	MK-4	VK-4	VK-5	VK-6
PRICE	200.00	230.00	250.00	280.00	295.00	325.00	345.00	375.00	420.00	340.00

* M models complete with hinged door and hearth plate.

V models have counterweighted vertical lift door.

K models include Selective Power Modifier for input control to correct temperature lag.

ACCESSORY EQUIPMENT

Electronic operated Veri-tron Indicating and controlling pyrometer, with thermocouple and lead wire.....\$149.00
 Same in self-contained, enclosed panel including line switch and fuses, with steel stand—completely wired..... 275.00
 Steel stand with shelf..... 50.00

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FREE LITERATURE

NEW CATALOG completely describes all models and applications for each. Write today for your copy . . . no obligation.



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Good territories open on this extensive line of self-contained small electric furnaces. Investigate now.

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INDIANAPOLIS MACHINERY EXPORT CORP.

Export Manager, 44 Whitehall Street, New York, New York

Guest Editorial

By GEORGE S. BENSON

President, Harding College, Searcy, Kansas

MOST people thought Henry Ford's ideas about putting wheels under every American were just a lot of bunko. They just couldn't see how anything like that could be done. Some of Ford's early partners failed to grasp the idea, for they thought of automobiles as belonging to the rich. Ford's idea was too "harebrained" for them. They couldn't understand how anybody could possibly make a living selling cars to "poor" people.

But Henry Ford had the grain of an idea and the courage to see it through. America was a nation that encouraged such things. With an original investment of \$28,000, he put the nation literally on wheels. Mass production was brought into its own, and costs came down. Ford wanted to make only a small profit on each car, and this sold millions of them. Competitors had to offer good values, too.

Tin Lizzie and her imitators called for roads. Dozens of new industries came into being, in the building of roads. Our highways would circle the globe 41 times. Lizzie and the others had a thirst for gasoline. America's petroleum industry grew enormously. Filling stations had to quench that thirst. All these things made jobs. America became an industrial power, with this Ford-inspired motive power all the while adding to her efficiency and activity.

This new mass production created great industrial empires; mines for coal and iron, rubber plantations, timberlands and saw mills, hydroelectric works, chemicals, glass, textiles. The result was more and more jobs, bigger and bigger payrolls, more and more goods and products that people wanted. Then, with our cars we became a touring nation. All our states became neighbors. We came to know the face of America, the beautiful.

Out of that \$28,000 and his idea, Ford developed a great industrial empire, with factories and assembly plants and branch offices. Yet, aside from the factories and the equipment that he owned, Henry Ford probably never owned more than 2 per cent of the wealth that he created. He was called a billionaire, but he counted his resources in buildings and machinery, not in money.

Ford was free to plow back his earnings into an industrial empire that created jobs and produced wealth, mostly for other people. There were no personal income taxes to penalize individual effort. In fact, corporation taxes did not begin until Ford's industry was five years old, and then the tax was only 1 per cent. It did not exceed 13 per cent any year until 1932. Today, taxes are a multi-million dollar item on many a company's books.

Demands from the tax collector have made impossible a contribution like Ford's from any individual American in this generation. Present tax laws, and mushrooming growth of a revenue-taking government, make it almost certain that there will not be another Henry Ford, or anyone like him. Are we thus penalizing the future of America? Who knows what need may arise for the genius of a Ford, in years to come?

Our nation must never lose its inventive genius. This genius can best thrive in a climate of complete economic freedom. The spirit of industrial venture that Ford typified must be kept alive, for the good of America. Ford's contribution brought untold blessings to all of us. We should not make it impossible, through heavy taxation burdens, for any future Henry Fords to develop in America.

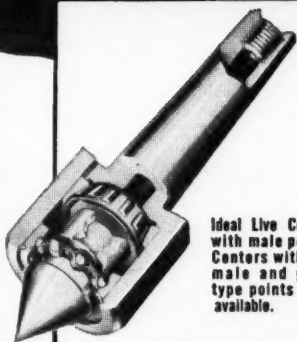
They Cut Job Time in Half...

with **IDEAL Live Centers**

Mr. Paul Schmidt, foreman winding department, Milwaukee branch of the John Oster Manufacturing Co., Racine, Wis. says: "By using Live Centers when turning the commutators on our Wound Armatures we have reduced the (handling) time by approximately 50% . . . obtain a heavier cut . . . reduce heating by friction."



This case history is typical of what's being reported all over the country. On light and heavy turning jobs, wherever they are used, Ideal Live Centers are raising both quantity and quality of lathe work, cutting production costs. Because they turn with the work, even on the lightest turning jobs, Ideal Live Centers eliminate all friction between work and center. There's no grabbing or gouging, no time loss for lubrication or grinding. Work is more accurate, spoilage is reduced. Deeper cuts and higher turning speeds are safely achieved. Ask for information and a free demonstration on your own work. **IDEAL INDUSTRIES, Inc., Sycamore, Ill.**



Ideal Live Center with male point. Centers with female and pipe type points also available.

Also Heavy Duty Live Center — built to carry heavy loads. Accurate to .0005.



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News of the Industry

Norton Company Dedicates New Plant

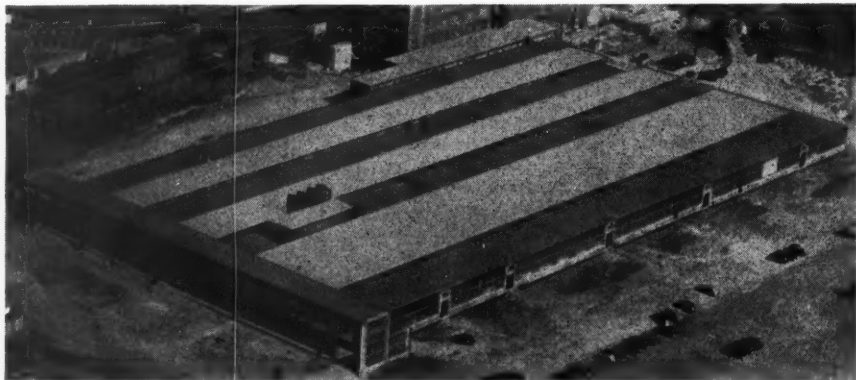
The Norton Co., Worcester, Mass., dedicated a new manufacturing plant in a private ceremony on August 30. Over 602 feet long and 320 feet wide and containing approximately 5 acres of manufacturing space on one floor, the building is said to be the largest in the world for the manufacturing of grinding wheels.

George N. Jeppson, chairman of the board of the Norton Company, delivered the opening dedicatory address on the subject of "A Vision Becomes a Reality," at the conclusion of which he turned the new plant over to Milton P. Higgins, president. Mr. Higgins gave the actual dedication talk. Other speakers were Ralph F. Gow, executive vice president, and Wallace T. Montague, vice president. Andrew B. Holmstrom, vice president and general manager of the Abrasive Division, was chairman of the program and introduced the speakers.

The total cost of the new building, designated as Plant 7, was estimated by company officials at \$4,300,000, of which \$1,800,000 was for the building alone and

\$2,500,00 for equipment. The huge building lends itself ideally to straight line production, and parallel manufacturing lines have been set up throughout the 602-foot length of the plant. The building contains the latest equipment in the way of fluorescent lighting, ventilation, dust collection, and fire protection, as well as modern locker and shower rooms, cafeteria, hospital, and offices. All facilities were planned to accommodate 800 persons employed on two shifts.

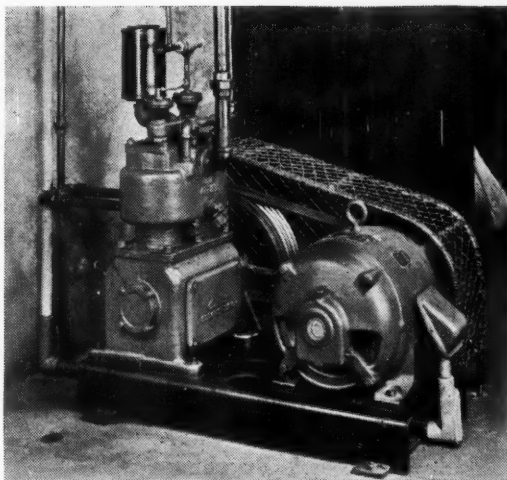
The building has glass and brick walls built around a steel frame. Eighty-two per cent of the wall area is devoted to windows to permit entry of a maximum amount of daylight. The roof is of a Monitor type design to further permit entry of daylight and to allow for maximum ventilation, and is constructed of precast concrete slabs above which is 2 inches of insulation to keep the plant cool. Because of the many continuous lines of production, the building has cross-over bridges to permit the personnel to go back and forth to their jobs by the easiest and most direct route. The inside of the entire plant has been painted a shade of light green considered restful for the eyes, and the cafeteria, hospital, and offices have acoustic ceilings.



Airplane View of New Norton Plant 7

Curtis Timken Bearing Air Compressor. Sizes from 1/4 to 50 H. P., inclusive.

**RELIABILITY
That Pays Off
in Low-Cost
Performance**



CURTIS TIMKEN BEARING AIR COMPRESSORS

Every Curtis Air Compressor has been carefully engineered, made of the highest quality materials and precision built throughout.

Check These Design Features:

- Timken Roller Bearings
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- Carbon-Free Disc Valves
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Capacities from 1/4 to 50 H.P. (up to 300 CFM).

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Plant of The Cincinnati Planer Company Recently Purchased by Giddings & Lewis Machine Tool Company

Giddings & Lewis Purchases Cincinnati Planer Company

Purchase of all the capital stock of The Cincinnati Planer Co., Cincinnati, Ohio, has been announced by the Giddings & Lewis Machine Tool Co., Fond du Lac, Wis. Ralph J. Kraut has been elected president of Cincinnati Planer. Other

officers are J. H. Daum, Cincinnati, executive vice president and general manager; Jesse Daugherty, vice president and works manager; W. E. Rutz, Fond du Lac, vice president; R. J. Steiner, secretary and comptroller; R. E. Hanson, Fond du Lac, treasurer and counsel; R. D. Allison, assistant treasurer and assistant secretary; E. W. Kroeger, assistant sales manager; C. J. LaMoth, executive assistant; W. B. Wigton, chief electrical engineer; J. W. Knippling, purchasing agent; and J. G. Daum, production manager. The board of directors of the Cincinnati company will consist of Mr. Kraut, Mr. Rutz, Keith F. Gallimore of Fond du Lac, J. Roy Porter of Chicago, Joseph M. Conway of Green Bay, William E. Buchanan of Appleton, J. H. Daum, and Attorney Hanson.

The Cincinnati Planer Company was formed as a partnership in 1898. In March of the following year the business was incorporated in Ohio with a capital of \$30,000 and was named The Cincinnati Planer Company. The Cincinnati Planer line was supplemented with a line of vertical boring mills in 1908, and of planer type milling machines in 1925. These machine tools are used extensively in all metal-working industries.

The present plant and office building, located in Cincinnati, were built during the period from 1906 to 1910, expanded in 1917, and again in 1942. Facilities are adequate and modern with floor space totaling 105,000 square feet. The Cincinnati Planer Company has approximately 400 employees. The corporate entity will be retained and it will continue to operate at Cincinnati as a wholly-owned subsidiary of Giddings & Lewis.

STERLING DRILL GRINDER



CAPACITY:

$\frac{3}{8}$ " to 2 $\frac{1}{2}$ " drills.

5" x 9" adjustable table.

MOTOR: $\frac{1}{2}$ hp,
3450 rpm.

NET WT: 250 lbs.

CRATED: 320 lbs.

MCDONOUGH MANUFACTURING CO.

EAU CLAIRE, WISCONSIN, U. S. A.

AIR OILED

by NORGREN Lubricators

The fastest, most positive method known for lubricating air driven tools and cylinders.

Automatically inject clean oil into the airstream, creating an oil-air fog which travels with the air. This coats all moving parts of the tool or cylinder with protective film of oil.

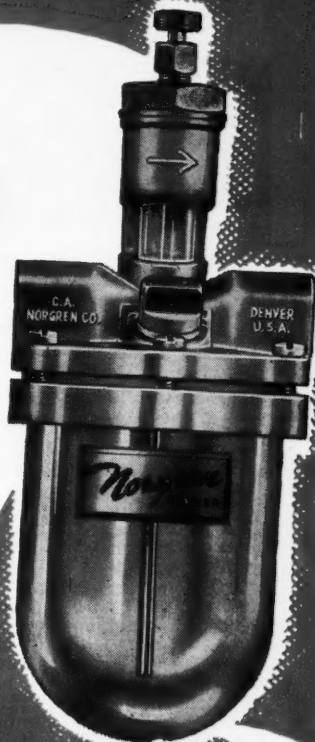
Works only when the tool runs. Protects *all* the time against

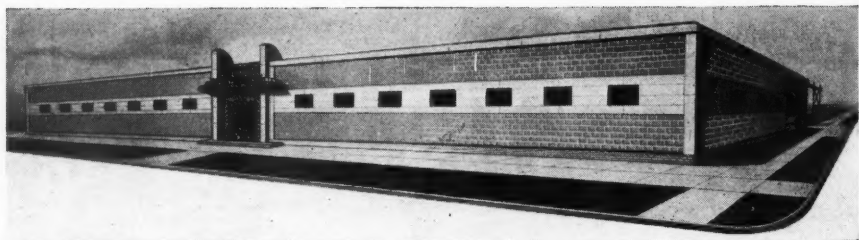
- (1) excessive wear while tool operates**
- (2) rust and corrosion while tool is idle**

End lubrication troubles the NORGREN way . . . oil the air that drives the tool.

Write C. A. Norgren Co.
222 Santa Fe Drive,
Denver 9,
Colorado.

Norgren





Architect's Drawing of New A.S.T.E. Central Office Building

New Quarters for A.S.T.E.

Its own building to house the activities and central office of the American Society of Tool Engineers has become a reality. Construction of the new quarters is now under way and the A.S.T.E. will move its headquarters from the Penobscot Building to the attractive new edifice by November 1, according to an announcement by I. F. Holland, national president of the society.

The building is being erected on a 224 x 100-foot tract on Puritan Avenue between Monte Vista and Manor Avenues in northwest Detroit. The 12,000 square feet of floor space will be available on one floor in a modern type of building. The new quarters will immediately house the offices of the executive secretary and his staff, other key employees of the society, and the offices of the various national committee activities.

The floor plan of the new building features a large general office area with smaller offices to be assigned to executives and special departments. Enlarged facilities will be available for mailing and shipping, as well as more room for the accounting department equipment. Building specifications call for an oil-fired forced warm air heating system, a 30-ton

ice capacity air conditioning plant, and a combination garage and loading dock. A combination conference room and reference library will be an additional feature of the new headquarters.

A.S.T.D. Fifth Annual Conference

The American Society of Training Directors, a national organization embracing a membership of nearly 500 in 12 affiliate chapters, will hold its fifth annual conference at the Hotel Carter, Cleveland, Ohio, March 3, 4, and 5, 1949.

The society, which is composed of personnel engaged in job training activities in industries throughout the country, is making plans to cover all of the latest developments in the training field during its three-day conference.

Houghton Opens New Plant in Canada

E. F. Houghton & Co., Philadelphia, Pa., has announced the completion and opening of its Canadian affiliate company's new plant in Toronto. Opera-



MILWAUKEE SURFACE PLATES

In sizes ranging from 3 1/4" x 4" to 48" x 96", MILWAUKEE SURFACE PLATES meet every need for accuracy and durability. They are sturdily constructed of the highest quality semi-steel and the table surface can be planed, ground, or scraped depending upon the degree of exactness required.

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Engineers and Machinists Since 1907

126 E. Pittsburgh Ave.

Milwaukee 4, Wisconsin

UNITED STATES ELECTRICAL TOOLS

*America's Greatest and
Most Complete Line—*

PROVED QUALITY

PROVED ECONOMY

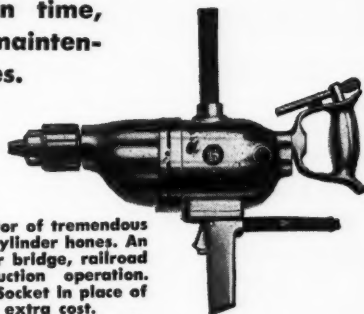
PROVED PERFORMANCE

WHEN industry calls
...these electric tools
answer "here" for
the innumerable jobs which demand
precision - efficiency and instant re-
sponse. *Maximum* savings in time,
labor and costs . . . *minimum* mainten-
ance and most economical prices.

- Drills
- Grinders
- Surfacers
- Polishers
- Sanders
- Tappers
- Hole Saws
- Buffers
- Valve seat
grinders
- Valve
refinishing
shops
- Flexible
shaft
machines

$\frac{3}{8}$ " Heavy Duty Drill

Rugged design. Motor of tremendous power for driving cylinder hones. An exceptional tool for bridge, railroad and major construction operation. No. 2 Morse Taper Socket in place of geared chuck at no extra cost. 100% anti-friction bearings throughout. Ball bearing on armature. Ball and needle-roller on chuck and intermediate spindle. Also available in $\frac{1}{4}$ " and $\frac{1}{2}$ " heavy duty drills.



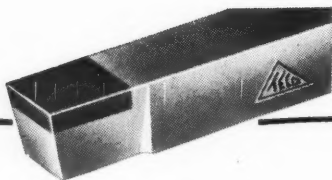
Model 58HD

**CONTACT YOUR JOBBER . . .
HE CAN SUPPLY YOU**

Leading automotive, mill supply, hardware, elec-
trical, plumbing, machinery and farm implement
jobbers carry United States Electrical Tools IN
STOCK.



The UNITED STATES ELECTRICAL TOOL Co.
CINCINNATI, OHIO



CARBIDE USERS

Get —more pieces per grind
—more grinds per tool
—less down time
—Lower tool cost

with—

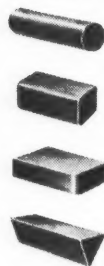


CEMENTED CARBIDE

LOOK AT THESE CASES*

Turning O.D. Cylinder Liner:	
Pieces per grind (TECO).....	28
Best previous carbide.....	5
Facing Cast Iron Valve Flange:	
Hours per grind (TECO).....	20
Best previous carbide.....	12

*Many more on file.



TRY A RUN with TECO Cemented Carbide and be convinced. Specify TECO when ordering carbide tools or blanks from your fabricator or distributor. Carbide tools tipped with TECO are more productive, always uniform. Our engineering department is at your service on any carbide problem.

TUNGSTEN ELECTRIC CORP. 562 39th St.
UNION CITY, N. J.

Manufacturers of Tungsten Carbide—from ore to finished material—for over a quarter century.



CEMENTED CARBIDE

tions are under the direction of Edward H. MacInnis, vice president and director of sales. The same products for metal and textile processing and maintenance will be made as are supplied from Houghton's four plants in the United States.

Located at 100 Symes' Road in northwest Toronto, the new property covers 2½ acres and is so situated as to take full advantage of both rail and truck shipping facilities.

Did You Know?--

Milton Grandquist Co., 201 Washington Ave., North Minneapolis, Minn., has been appointed sales representatives of The Cleveland Tapping Machine Co., Hartsville, Ohio, and will handle the sale of the entire Cleveland line of standard and special single and multiple hole precision production tapping machines and accessory jigs, fixtures, and feed devices in Minnesota, western Wisconsin, northern Iowa, and eastern North and South Dakota. The Cleveland Tapping Machine Company has also reaffirmed **Robert R.**

Stevens Machine Co., 1706 Olive St., St. Louis 3, Mo., as its representative in Missouri, southern Illinois, Kansas, Oklahoma, eastern Nebraska, and eastern Colorado, and **C. J. Harter Machinery**, with offices at 3833 Navigation Building, Houston, and 601 Gulf-States Building, Dallas, in the State of Texas.

Ercell R. Stevens of the Norton Co., Worcester, Mass., has been appointed abrasive grain engineer in the Chicago district. The area formerly covered by W. T. Seiter has been divided into two territories which will be covered now by both Mr. Seiter and Mr. Stevens.

The Baldwin Locomotive Works, Philadelphia 42, Pa., has announced that **Lewis W. Metzger**, vice president, has been made executive assistant to Marvin W. Smith, executive vice president, and will assist Mr. Smith in all phases of Baldwin's operating activities. Announcement has also been made of the appointment of **James R. Weaver** as manager of manufacturing, Eddystone Division, and **John S. Newton** as manager of engineering, Eddystone Division.

The Cyril Bath Co., 6988 Machinery Ave., Cleveland 3, Ohio, machine tool and special machinery manufacturer, has acquired the Goodyear patents on roto forming in the United States, Canada, and England.

**EVERY
STATE
WANTS BAY
STATE**

**PRECISION
PERFORMANCE**



**ON THE SHELVES OF
YOUR NEARBY INDUSTRIAL
SUPPLY DISTRIBUTOR
IN EVERY STATE**

BAY STATE TAP & DIE CO.
MANSFIELD, MASS.

Did You Know?---

The Barber-Colman Co., Rockford, Ill., has appointed **Paul Wichelhaus**, Apex Machine Tool Supply Co., 312 N. McDowell St., Charlotte, N. C., as exclusive distributor of Barber-Colman hobbing machines, hob sharpening machines, hobs, cutters, and reamers in the States of North and South Carolina.

John Crampton, 1114 Chester Ave., Cleveland 14, Ohio, has been appointed a representative of the Detroit Broach Company.

The Fedal Machine and Welder Company has arranged to purchase the plant and facilities of the Warren City Manufacturing Company from the U. S. Navy. Federal has been operating this plant, building a complete line of all-welded steel presses, since January 1946, when it acquired the stock of the Warren City Manufacturing Company.

Robert L. Stubbs, expert on Cecostamping and sheet metal fabrication, has been retained by the Chambersburg Engineering Co., Chambersburg, Pa., originator of the Cecostamp.

Reorganization of operating personnel and a change in sales and manufacturing policy have been announced by **J. W. Kinnear, Jr.**, executive vice president of the Firth Sterling Steel & Carbide Corp., McKeesport, Pa. Major personnel changes in the new organization plan include the appointment of **W. J. Loach** as manager of carbide development and quality control; **Charles W. Iams, Jr.**, manager of carbide production and fabrication at the McKeesport plant; **E. G. Moffat**, works manager of the corporation's recently completed plant at Milford, Conn.; and **A. B. Vestal**, superintendent of plant engineering at McKeesport. **L. G. Firth**, in addition to his duties as president of the corporation, has accepted the office of director of technical development.

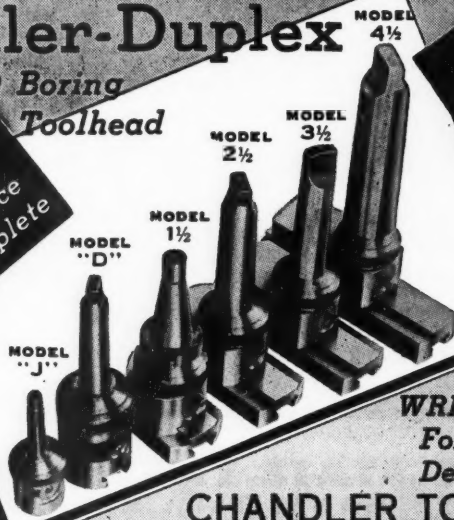
The Reltok Diamond Tool Co., 10 Franklin St., Allston 34, Boston, Mass., has announced that **Frank W. Kotler** former vice president and general manager of the F. F. Gilmore Co., Boston, has become affiliated with Reltok, manufacturer of grinding wheel dressers, turning and boring tools, diamond penetrators, diamond recording styli, engraving and etching tools, and diamond contacts.

For ANY Size Machine Chandler-Duplex

COMBINED Boring
and Facing Toolhead

A Boring Head
That Won't Face
Is NOT Complete

A Few
Openings
For GOOD
Distributors

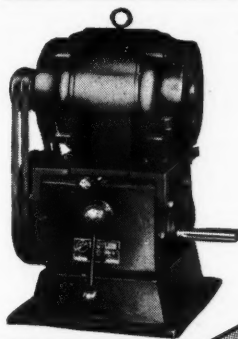


NOW!
REDUCED
IN
PRICE

Accuracy
-- Stamina

WRITE TODAY
For Complete
Details

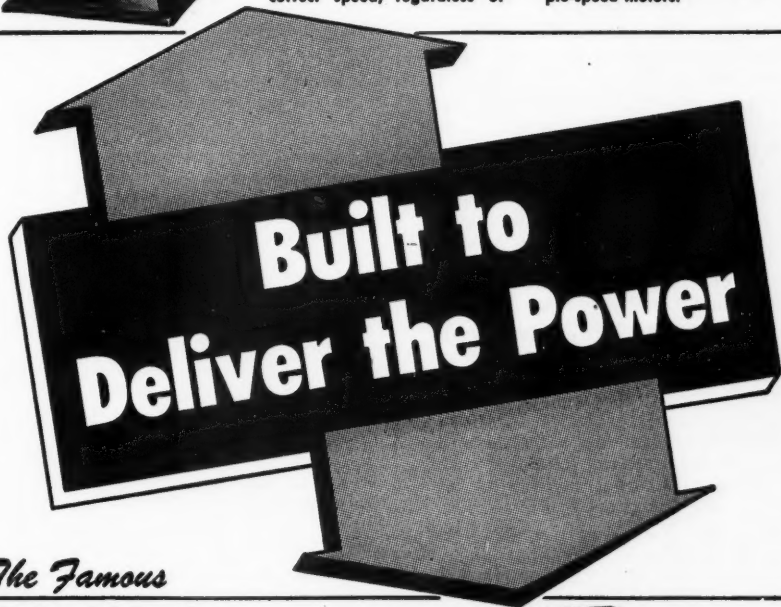
CHANDLER TOOL CO
MUNCIE, INDIANA, U. S. A.



The New **TURNER** *Multi-Speed* **POWER UNIT**

Power transmission FLEXIBILITY...now available for industrial applications. Where predetermined speeds are needed, or in problems of speed production with multiple speeds, Turner has the answer. Just a flick of the wrist selects the correct speed, regardless of

changeable conditions. Ideal for mixing, agitating, printing presses, textile, wood and paper processing, feed rolls and conveyors...scores of other applications. In many cases, replaces hard-to-get slip-ring and multiple-speed motors.

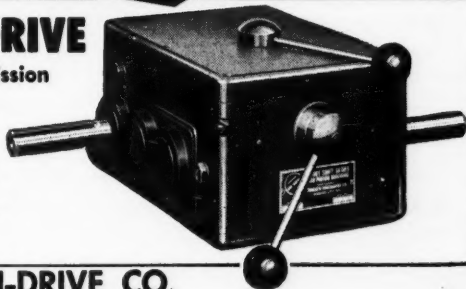


The Famous

TURNER UNI-DRIVE

Selective Sliding Gear Transmission

Make older machines more versatile. Operate each independently. Eliminate overhead line and counter shafts with Turner Uni-Drive! Save time, cut costs...3, 4, 6, 9 speeds to meet every need. Standard brackets for quick installation on lathes, shapers, screw, milling and hobbing machines, boring mills... many others.



THE TURNER UNI-DRIVE CO.

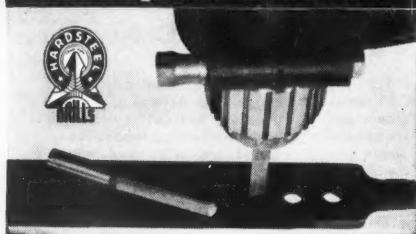
(Sales Division, Turner Machinery Co.)

3416 Terrace Street

Dept. 105

Kansas City 8, Mo.

Drill Hardened Steels without Annealing with "HARDSTEEL"



Don't let anyone tell you that hardened steels must be annealed before drilling, countersinking, counterboring or reaming.

With "HARDSTEEL" drills you can produce accurate, smooth holes in steel hardened by any process—oil-hardened, water hardened, cyanided, nitrided, and they work equally well on work-hardening steels and high carbon-high chrome steels of any degree of hardness.

"HARDSTEEL" drills used with standard drill presses cut costs in production shops because parts drilled after hardening always match at assembly. In service shops they save time and material and permit engineering changes calling for additional drilling to be made after parts are full hardened.

Write for a copy of the "HARDSTEEL" Operators Manual showing how "HARDSTEEL" drills are now functioning in thousands of plants in parts recovery operations.

**You Harden It — We'll Drill It —
with "HARDSTEEL"**

**"HARDSTEEL" Tool bits make
faster, deeper cuts on steels
and non-ferrous alloys.**

BLACK DRILL CO., Division Black Industries
1372 East 222nd Street + Cleveland 17, Ohio

"HARDSTEEL"

DRILLS • TOOL BITS • SPECIALS

Did You Know?---

According to announcement made by the Rudel Machinery Co., Inc., New York 17, N. Y., **David F. Robinson** and **William E. Rudel** have been appointed vice presidents and district managers, Mr. Robinson being in charge of the New York and Hartford territories and Mr. Rudel in charge of the Boston office and the other five New England states. **Ransom Soper** has been named to take charge of the Long Island territory. **George F. Teimpidis** has joined the organization as chief engineer to have direction of quotations made from the New York office, as well as assisting the sales force in problems of engineering. **J. E. Baxley** has also joined the company in the capacity of hydraulic engineer.

Hufford Machine Works, Inc., Redondo Beach, Calif., manufacturer of hydraulic stretch forming machines, hydraulic presses, and special hydraulic equipment, has appointed **Walter George Wheeler**, an engineering graduate of California Institute of Technology and a member of the A.S.M.E., as chief engineer.

The Rapids-Standard Co., Inc., Grand Rapids, Mich., manufacturer of material handling equipment, has announced the adoption of the term "RapiStan" as a trade mark to designate all equipment manufactured by the firm.

Gilbert B. Richards has been appointed general sales manager of Firth Sterling Steel & Carbide Corporation with headquarters at McKeesport, Pennsylvania, to co-ordinate the sales of the steel, carbide and tool-making divisions of the company.

Die-Mold Corporation, designer and builder of tools, dies, and molds for the die casting, permanent mold casting, and plastic industries, has moved into a new brick factory building at 6619 Motor Ave., Milwaukee 13, Wis., where increased floor space for expanded shop and office facilities is available.

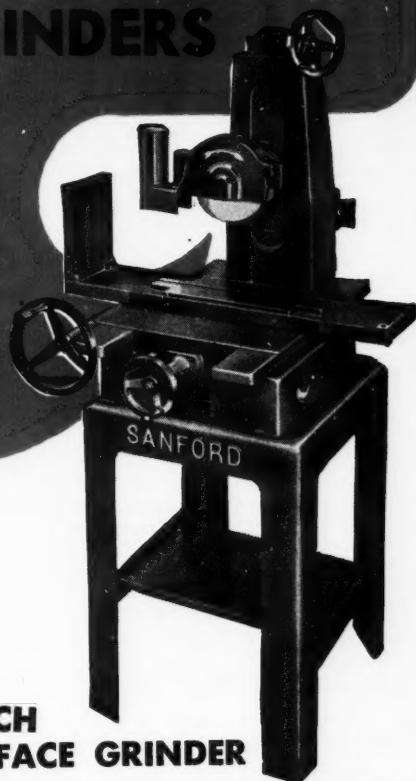
Recent changes in the portfolio of **Power Plus Products Co.**, 2228 Bellevue Ave., Detroit 7, Mich., have been announced by **Frank G. Yates**, chairman. **Dean W. Johnston** has been appointed manager of sales and distribution; **Elwyn Kaake**, chief engineer in charge of engineering and production. **Charles Billaudeau** is in charge of production of the Electrical Division; **Thomas Jones**, the Armature Wedge Division; **Phillip Brod**, the Plating Division.

SANFORD

SURFACE GRINDERS

Model MG

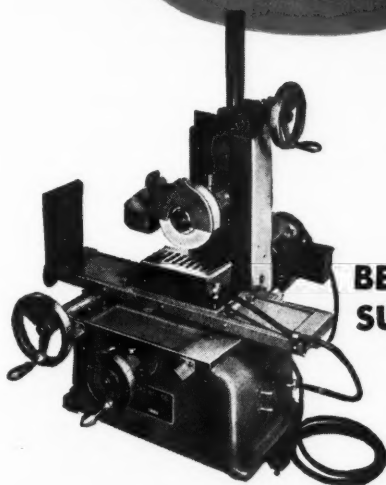
Handles many odd size tool room and production jobs, due to its capacity of 8" x 12" x 12". Actual movements — Transverse 8¾" — Longitudinal 13" — Vertical 12" (under 7" wheel).



**BENCH
SURFACE GRINDER**

Model SG

A sensitive, highly accurate machine specially designed "for the job that fits in your palm." Actual movements — Transverse 4" — Longitudinal 8" — Vertical 6" (under 4" wheel).



WRITE FOR COMPLETE DETAILS

SANFORD MANUFACTURING CO.
1021 COMMERCE AVENUE
UNION, NEW JERSEY

Did You Know?---

H. William Kopt, manager of the Detroit office of Pratt & Whitney, Division Niles-Bement-Pond Co., West Hartford 1, Conn., died August 13, 1948 at the age of 66 after an association with the company for 46 years. **Elmer E. White**, Milwaukee sales engineer for P&W small tools and gages, died July 21, 1948 at the age of 52, having represented Pratt & Whitney in the Milwaukee area since 1927.

Max C. Jones, president, has announced the appointment of **Robert O. Blackford** as advertising and sales promotion manager of the Michigan Abrasive Co., Detroit, Michigan.

The B. C. Ames Co., Waltham, Mass., has appointed the **Geoffroy, Co.**, P. O. Box 67, Capitol Hill Station, Denver 6, Colo., as its exclusive agent in Colorado, Utah, and Wyoming for the complete Ames line of micrometer dial gages and indicators.

Carl A. Carlson, sales engineer for the Norton Co., Worcester, Mass., died Sunday, August 29, in a plane crash near Winona, Minnesota.

To better serve its customers in the Philadelphia area, the **Gisholt Machine Co.**, Madison, Wis., manufacturer of turret lathes, automatic lathes, and balancing machines, has opened a new and larger branch office at 315 McClatchy Bldg., 69th and Market Sts., Upper Darby (Philadelphia), Pa. **P. R. Fosseid** will continue in charge of the territory, assisted by **Ervin A. Huza**.

Bremen Bearings Inc., Bremen, Ind., has been formed by **Clyde C. Cone**, formerly associated with Torrington and Kaydon Engineering, to produce precision needle bearings in large and small quantities and in all sizes.

The trustees of **The James F. Lincoln Arc Welding Foundation** have announced September 15, 1948 to April 1, 1949 as the period for submitting entries in its annual Engineering Undergraduate Award and Scholarship Program. The current competition is the second in a ten-year series of programs which offers to engineering undergraduates (including agricultural engineers) the opportunity to compete in the preparation of papers on various phases of welding for monetary awards, as well as scholastic and industry recognition.

Motorized HOPPER UNITS

*Speedy
Sturdy
Dependable*

FASTEST FEED . STURDY WIDELY ADAPTABLE

For use with Presses, Centerless Grinders, Thread Rolling and Slotting Machines, or any special machine.

Successfully Feed

Screws, Screw Blanks, Rivets, Pins, Discs, Nuts, Bearing Rollers, Steel Balls, Washers and Miscellaneous Items, such as Screw Machine Parts, Stampings, Etc.

Send Samples for Details and Prices

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DETROIT POWER SCREWDRIVER CO.

2807 West Fort Street,
Detroit 16, • Michigan





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**AUTOMATIC
 NUMBERING
 HEADS**

Noblewest automatic numbering heads are the product of long experience and guaranteed to be the finest obtainable. Standard models are available in any size numbers from $1/40"$ to $1/2"$. Special numbering heads made to any requirements, including embossing heads and numbering heads combined with dies. Write for complete information to Noble & Westbrook Manufacturing Co., 25 Westbrook St., East Hartford 8, Connecticut.

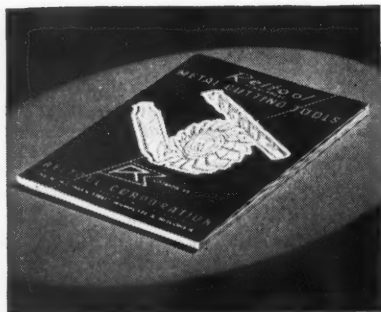
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MARK IT
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EQUIPMENT FOR MARKING • GRADUATING • EMBOSSING • NUMBERING



...Have You Seen the **NEW** Catalog by **RELTOOL?**

This attractive new book belongs in your files. Illustrates and describes the Complete, Augmented Line of Reltool Metal Cutting Tools which includes: —

- Center Drills—Standard and "Shockless" Regular and Bell type.
- End Mills and End Mill Holders.
- Small End Mills—Special High Speed — ground out-of-the-solid.
- Milling Cutters — All Types — Key Seat Cutters, Form Tools.
- Metal Slitting Saws — All Types — Side Chip Clearance and Screw Slotting Saws.
- Special Saws—Rotary Shears, Formed Tooth Saws, Tenacious Saws, Jewelers Saws, and others.
- Reamers, Center Reamers, Counterbores, Taps.
- Cut Off Blades, Tool Bits—All Grades.
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Get acquainted with Reltool Metal Cutting Tools through this Complete, Attractive Catalog. Write for it, write now!

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RELIABLE METAL CUTTING TOOLS
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A 3486-½

Did You Know?---

Clyde Edwards, who was formerly in an executive position with the General Motors Corporation and until recently represented the Gatco Bushing Co., Detroit 7, Mich., in Wayne County, has now taken over the entire State of Michigan as sales and service engineer for Gatco.

The election of **Walter W. Kempfert** as vice president in charge of sales has been announced by Bolton Sullivan, president of Skilsaw, Inc., Chicago, Ill., manufacturer of portable electronic tools. Mr. Sullivan has also announced that **J. J. Topolinski**, works manager of Skilsaw, Inc., has been elected vice president in charge of manufacturing.

Sherrill S. Deputy, assistant sales manager of American Wheelabrator Equipment Corp., Mishawaka, Ind., since 1946, has been appointed sales manager of the company.

Lester G. Sigourney, general sales manager of New Departure, Division of General Motors Corp., Bristol, Conn., has retired after an association with the firm of 40 years.

Wilbur C. Massow, assistant sales manager of Walsh Press and Die Company, Division of American Gage & Machine Company, passed away July 26 in Chicago after a very brief illness.

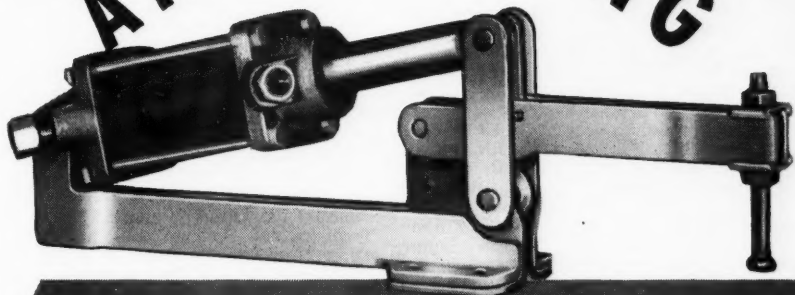
Hammond Machinery Builders, Inc., Kalamazoo, Mich., has announced the appointment of **Arthur L. Perkins**, 5C River Park Apartments, White Plains, N. Y., as its Eastern representative.

Neil C. Hurley, 78, chairman of the board of the Independent Pneumatic Tool Co., Aurora, Ill., died August 2 at his home in River Forest, Illinois, following a heart attack.

The appointment of **E. W. Chapman** as vice president in charge of engineering has been announced by **G. B. Tuthill**, president of the Tuthill Pump Co., Chicago, Illinois.

The complete company setup, including equipment, patents, and so on, of the Eastern Cutter Corp., 30-32 Littleton Ave., Newark 7, N. J., has been repurchased by **A. R. Abeel, Sr.**, and will be under the guidance and presidency of Mr. Abeel, who has also purchased the entire plant and assets of the L.T.S. Cutter Co., Inc., 91 Edison Pl., Newark.

ANNOUNCING



LAPEER'S NEW MODEL AO-400 AIR-OPERATED CLAMP

Here's a wonder worker in air-operated clamps. Its maximum clamping pressure is 400 lbs. with 85 lbs. air pressure. The double-acting feature assures parts being securely held in case air pressure accidentally fails. Air pressure is required to unlock it.

Its versatility is especially recognized on remotely controlled as well as on multiple clamping jobs. One valve can control any number of clamps simultaneously.

*Cylinders are available separately, Model CY-400
for pressures up to 2000 psi.*

Valves furnished at reasonable prices.

**KNU-VISE
PRODUCTS**

LAPEER MANUFACTURING CO.
3036 DAVISON ROAD • LAPEER, MICHIGAN

Did You Know?---

The advancement of four executives in the coated abrasives division of Minnesota Mining & Manufacturing Co., St. Paul, Minn., has been announced. **Allan H. Butz**, former sales manager for related products, has been appointed general sales manager for related products and will also act as an advisor in the management group of coated abrasives and related products. Management of manufacturing of coated abrasive products will be the responsibility of **C. C. March**, formerly products manager in the manufacturing section. **Alfred L. Gilstad** has been promoted to manager of planning and service, previously being merchandising manager for "Safety-Walk" a non-slip floor surfacing product. The former sales office manager for the abrasives division, **Gilmore A. Salmon**, has been promoted to merchandising manager for all coated abrasives.

A jolly robust hunter with red coat has been adopted as an identifying symbol by the **Michigan Abrasive Co.**, Detroit, Mich., for its advertisements devoted to Michigan "Red Coat" Metal-Working Abrasive Belts.

The appointment of **P. J. Jensen**, formerly executive engineer in the engineering and research department of the **Carboloy Co., Inc.**, Detroit, Mich., to the position of manager of the Michigan district for Carboloy with headquarters in Detroit has been announced by **K. R. Beardslee**, vice president and marketing manager. Mr. Jensen succeeds **M. E. Knoll** who has retired after 19 years of service with Carboloy.

Sperry Products, Inc., Danbury, Conn., has appointed **Edward B. Lang**, formerly with the public relations department of the **General Electric Company** in Bridgeport, as advertising manager.

The **Butterfield Division**, **Union Twist Drill Co.**, Derby Line, Vt., has appointed **W. V. Garfield** district sales engineer for the company's line of taps, dies, reamers, screw plates, and other industrial cutting tools in Connecticut and western Massachusetts.

The **Howes-Woods Co.**, Cambridge, Mass., manufacturer of Woods metal cutting hack saw blades and accessories, has appointed **David A. Utiger** sales manager of the Saw Division.



Specials!

**CIRCULAR AND FLAT
FORM TOOLS FOR *all*
BAR MACHINES**

Stites' Personalized Screw Machine Tool Service for Cams and Tools has now been broadened to include the manufacture of circular and flat form tools for all bar machines. Combined know-how and accuracy built into every tool.

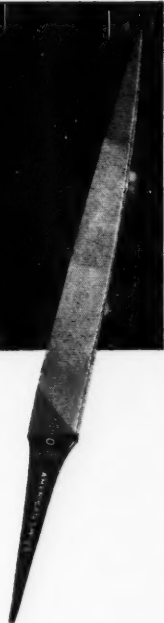
Circular and flat form tools illustrated typify our diversified engineering and manufacturing facilities for Acme, Cleveland, Davenport, Brown & Sharpe No. 00 and No. 6, and Warner & Swasey Machines. Deliveries to meet individual customer requirements.

STITES

THE STITES TOOL CO. 1426 W. 3rd St.
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"Naked-Eye" Inspection is not enough at AMERICAN SWISS



Here you see an "American Swiss" inspector checking every detail of an "American Swiss" File *under a magnifying glass*. His job is to make sure each file is perfect in size, shape, cut and hardness. If he finds a flaw of any kind, the file is dropped into acid to

make sure it will never be sold, for there is no such thing as a "second quality" "American Swiss" File. For more than 45 years, the "American Swiss" standard has been "Only The Best Are Good Enough". Make that your "buy-word" when you need Swiss-Pattern Files.

Buy from our Authorized Distributor.

AMERICAN SWISS FILE & TOOL CO.

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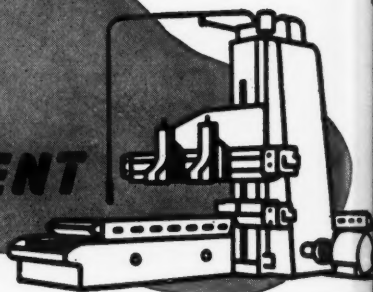
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SWISS PATTERN FILES

NEW SHOP EQUIPMENT



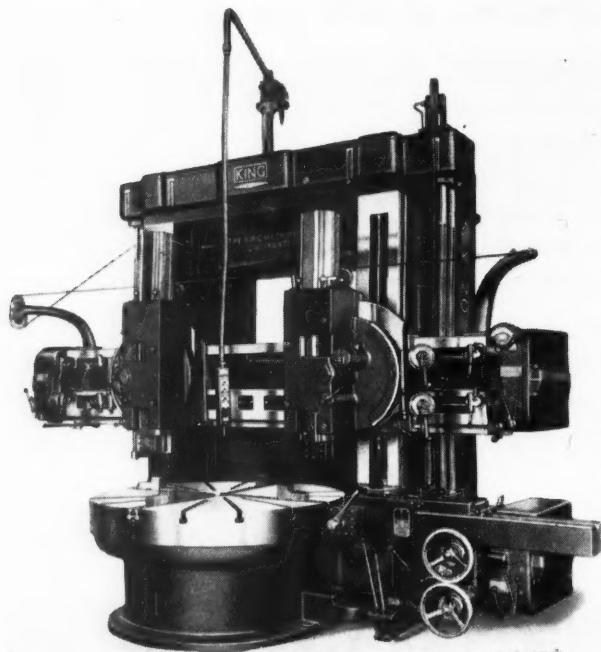
King Vertical Boring and Turning Machine

A vertical boring and turning machine embodying features which are said to provide for maximum accuracy, versatility, and ease of operation, as well as unusually long service life, is now being manufactured by American Steel Foundries,

King Machine Tool Division, Cincinnati 29, Ohio. Heavy and rigid construction, high power, wide range of feeds and speeds, and other advantages are said to make the machine particularly suited to the successful use of carbide tools.

The rectangular type heads of the machine are each equipped with four gibs and have eight bearing surfaces. Close tolerances are said to be maintained at high speeds with heavy feeds. The weight and rigidity of the unit are claimed to assure continued high accuracy over long periods of use. According to the manufacturer, operation of the machine is simply, quickly, and precisely effected. All controls are located at the front of the machine within easy reach of the operator.

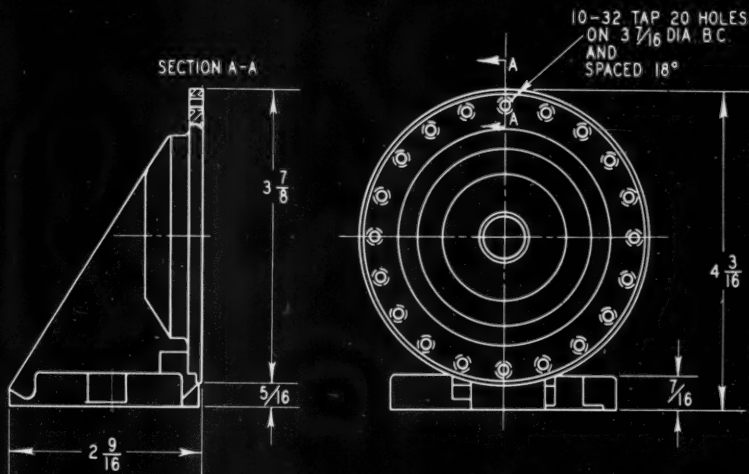
The King Vertical Boring and Turning Machine is available in a wide variety of head combinations and in 10 sizes, including single-column models in 30, 36, and 42-inch sizes and double-column models in 52,



King Vertical Boring and Turning Machine

PRODUCTION INCREASED 100% over Previous Method

with NATCO High Speed Sensitive Drilling and Tapping Machine



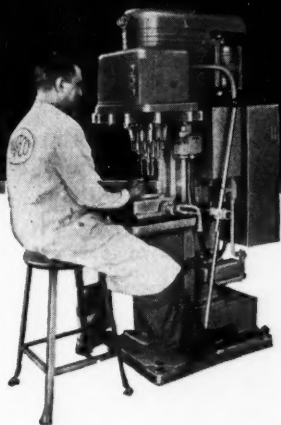
Part—Die Cast Diaphragm Cover

Operations—Tap Ten 10-32 Holes
Index

Tap Ten 10-32 Holes

Production—Approximately 300 Parts Per Hour

NATCO A33 Multi-Spindle Machines are built specifically to help you obtain more economical high speed, light sensitive drilling and tapping operations in your plant. They make possible remarkably high production and low hole cost in a wide range of small and medium sized work. Whether your production involves drilling and tapping operations in cast iron, in steel, in aluminum, in plastics or in wood, NATCO welcomes your inquiry and suggests that you send prints wherever possible. Write today!



NATCO DRILLING, BORING, TAPPING AND FACING MACHINES

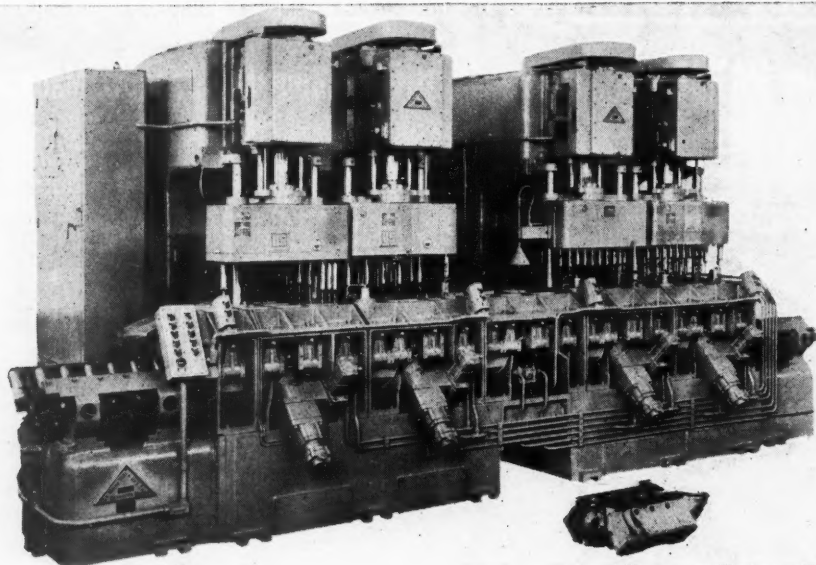


NATIONAL AUTOMATIC TOOL COMPANY, INC., Richmond, Ind., U. S. A.

Branch Offices: 1809 Engineering Bldg., Chicago • 409 New Center Bldg.,

Detroit • 1807 Elmwood Ave., Buffalo • 2902 Commerce Bldg., New York City

Call a Natco Field Engineer



LeMaire 7-Station Line Processing Machine

62, 72, 84, 100, 120, and 144-inch sizes. The machine shown in the accompanying illustration is a 72-inch size with two ram heads and side head.

LeMaire 7-Station Line Process Machine

Developed by the LeMaire Tool & Mfg. Co., 2657 S. Telegraph Rd., Dearborn, Mich., the 7-station line processing machine shown in the accompanying illustration is specially designed for drilling,

reaming, chamfering, and counterboring the bottom face of a "V-8" cylinder block.

The machine consists of two main center base sections of rigid welded construction which support two columns, the work-holding fixtures, and index mechanism. Each column supports two LeMaire No. 5000 twin ram self-contained hydraulic drilling units with multiple spindle drill heads which move on hardened and ground guide bars that keep the heads in alignment with the work-holding fixtures. The two end bases of the machine support the loading and un-



Rougher

"SKELTON" TAPER REAMERS

The Roughing Reamer with two cutting edges ground radial on a taper to correspond with hole to be reamed. Two opposite edges are "backed off" to govern chip thickness. This "safety edge" prevents "hogging in" or "chattering." A special feature permits straight, centralized holes, even though turret is out of line with spindle. Write for catalog 103 describing this reamer and the Helical Finisher also shown.

Morse, B & S and SAE Tapers in stock. Specials to order.

Dealer Territories Available

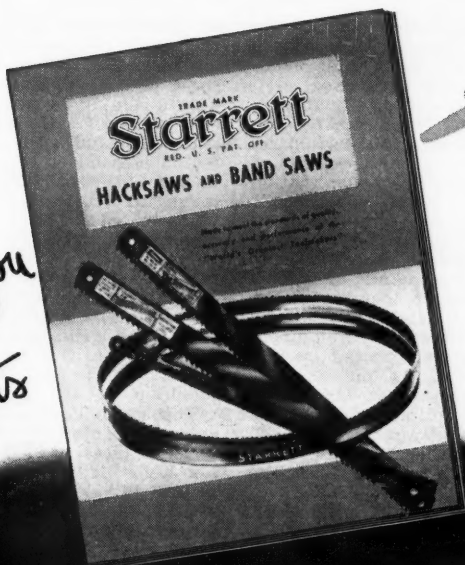
ONONDAGA TOOL CORPORATION

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NEW YORK**



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To help you
Cut
Cutting Costs



Ask for this ↑
Big, New

HACKSAW and
BAND SAW BOOK

Ask your Starrett Distributor for it. He'll reserve a special free copy for you, or mail the coupon today. If you use hacksaws or band saws, you'll find this data-packed book a practical up-to-the-minute guide to better, faster cutting at lower cost.

The L. S. STARRETT CO., Dept. "M.D."
Athol, Massachusetts, U. S. A.

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BAND SAW BOOK. Thanks.

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MECHANICS' HAND MEASURING TOOLS AND

PRECISION INSTRUMENTS - DIAL INDICATORS

STEEL TAPES - HACKSAWS AND BAND SAWS

PRECISION GROUND FLAT STOCK

Buy Through Your Distributor

loading mechanism, with a bridge type support carrying the work-holding fixture at the idle station. All drill guide bushings are mounted in the fixture.

Transferring of the work is effected hydraulically by means of a transfer bar with latch type fingers that retract on the return stroke of the bar. Location of the work for the first operating station is accomplished by a wedge type locator entering a cored opening in the side of the block. At this station two locating holes are drilled and reamed which are used as final locating points on subsequent operations. Rough location of the work at stations 3, 5, and 6 is made by locators entering the same cored opening, with final location effected on two reamed locating pins. As the work is transferred from station to station, it rides on spring mounted guide blocks which keep it snugly up against hardened guide bars. After final location, the cylinder block is locked up firmly against the guide bars.

The entire cycle, including transfer, rough locate, final locate, clamp, drilling cycle of head, unclamp, and withdrawal of locators, is automatically performed after the block has been placed in the loading station and the cycle button

pressed by the machine operator. The hydraulic mechanism for operating the locators and clamps is situated at the front of each operating station. All hydraulic piping is exposed to provide for easy access to all joints. The center idle station includes a decelerating valve which is used to bring the transfer bar to a gentle stop. Also at the idle station is an air jet to blow chips from deep holes drilled at the first operating station. Provision is made for the easy removal of chips through chutes at the rear of the machine. The guide bars and all operating parts of the work-holding fixture are automatically lubricated by a Bijur system. Each drilling unit has a push-button control at the front of the work-holding fixture to assist in setting up the machine.

The sequence of operations performed on the machine are as follows: (station 1) load; (station 2) drill 9 holes (2 locating holes drilled and reamed); (station 3) drill 16 holes, chamfer 1 hole; (station 4) idle; (station 5) drill 27 holes; (station 6) counterbore 10 holes, chamfer 28 holes, ream 1 hole; (station 7) unload. The production rate of the machine is said to be approximately 72 pieces per hour at 100 per cent efficiency.

USE WILLEY'S DIAMOND DRESSERS

With WILLEY'S METAL SETTINGS and NATURAL WHOLE DIAMONDS



Willey's Diamond Dressers can be adapted to all makes of grinders, for rough, semi-finish and finished dressing, for grinding hardened parts requiring a precision ground finish.

A trial will convince you there is no wheel dressing tool on the market, costing two or three times the price, that will equal its performance and cost per dressing.

WRITE FOR CATALOG 42 — Illustrates complete line of Willey's Diamond Tools and Mechanical Dressers.

No.	Usable Contents of the Diamonds		QUANTITY PRICES				Wheel Diameter
	Diameter	Length	1-25	26-50	51-75	76-100	
W-3	5/16	5/16	\$11.00	\$10.00	\$ 9.00	\$ 8.00	6 to 12
W-4	11/32	3/8	13.00	12.00	11.00	10.00	12 to 20
W-5	3/8	13/32	15.00	14.00	13.00	12.00	20 to 24
W-6	7/16	7/16	17.00	16.00	15.00	14.00	24 to 42

WILLEY'S CARBIDE TOOL CO.

SOLE MAKERS OF WILLEY'S METAL

1342 W. Vernor Highway

Detroit 1, Michigan

Write on your letterhead for
FULFLO MECHANICAL DATA BOOK

Cash in on These—

More Efficiency • More Economy



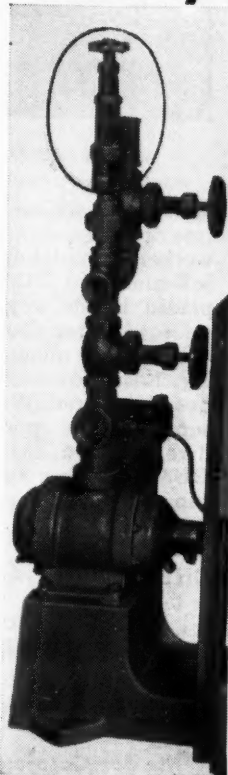
VALVES

BY-PASS OIL-RELIEF

IT'S always the right time to improve plant operation and functional efficiency of your equipment. **NOW** install these **NON-CHATTERING** valves . . . 5 springs for pressures from 5 to 300 lbs. pressure.

**NO MAINTENANCE
AFTER INSTALLATION**

Photo shows Fulflo relief valves in oil spray systems built by The Brown-Fayro Co., Johnstown, Pa.



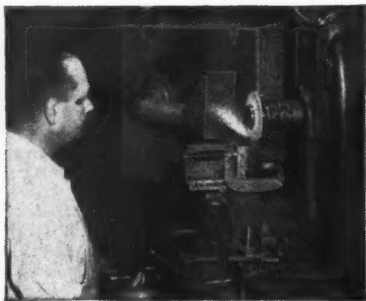
THE



Specialties Co., Inc.
BLANCHESTER, OHIO

STOP THAT DUST

with **DUSTKOP**



MODEL 420 ILLUSTRATED

■ Keep machines and workers free of costly, abrasive dusts. Stop worker's complaints. The portable, self-contained DUSTKOP can be placed beside any machine and relocated later. Can usually be in operation 20 minutes after uncrating. Easily connected with metal hose or pipe. With a cyclone separator and spun glass filter, a direct-driven, self-clearing fan, DUSTKOP has the high suction capacity to give you **TOP PERFORMANCE**.

CHECK THESE ADVANTAGES:

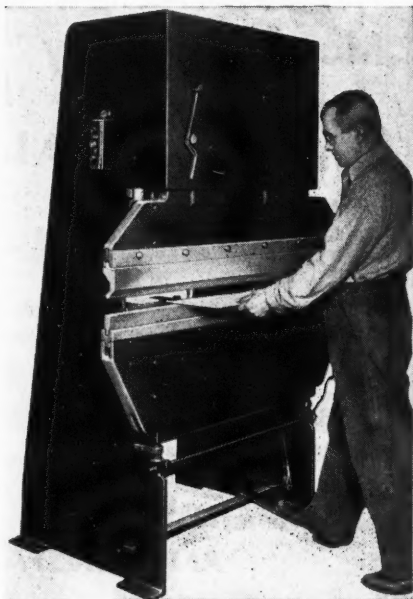
- ☐ **DUCTLESS** installation
- ☐ Operates only when needed
- ☐ Low maintenance
- ☐ Firesafe construction

Write for Catalog A-415 NOW

AGET-DETROIT CO.
207 Main at Washington
Ann Arbor, Michigan

Chicago Model No. 131 Steel Press Brake

Built to perform accurate work and supplement larger machines for all work within its rated capacity, the Chicago Model No. 131 Steel Press Brake illustrated herewith has been brought out by the Dreis & Krump Manufacturing Co., 74th St. and Loomis Blvd., Chicago 36, Ill. Said to be particularly useful in the quick and accurate manufacture of light sheet metal parts and products, the ma-



Chicago Model No. 131 Steel Press Brake

chine utilizes dies of the same standard type employed on all press brakes, and all operations of the unit are performed the same as on larger machines.

Features of the Chicago Model No. 131 Steel Press Brake include a smooth operating friction clutch and vari-speed drive. The all-steel construction and all-steel enclosed gearing of the machine are said to provide for safe operation. Standard equipment includes a lower die holder, vari-speed drive, back gauge, and motor and control for 2 or 3-phase, 50 or 60-cycle, 220 or 440-volt current. Dies and a front operated micrometer back gauge can be furnished as extra equipment.

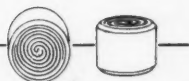
Specifications of the Chicago Model No.

TOUGHNESS
LONG LIFE

POWER

PROTECTION
DURABILITY

BALANCE



C/R Hammers have malleable iron heads with replaceable coiled rawhide faces.

RAWHIDE is tops for 'soft' mallets and hammers. And you can't beat *Chicago Rawhide*. Tightly coiled, specially treated C/R surfaces won't split, crumble or mushroom. They absorb shock, deliver powerful blows, protect delicate surfaces, and stand up under tough use.

Always ask for *Chicago Rawhide*.

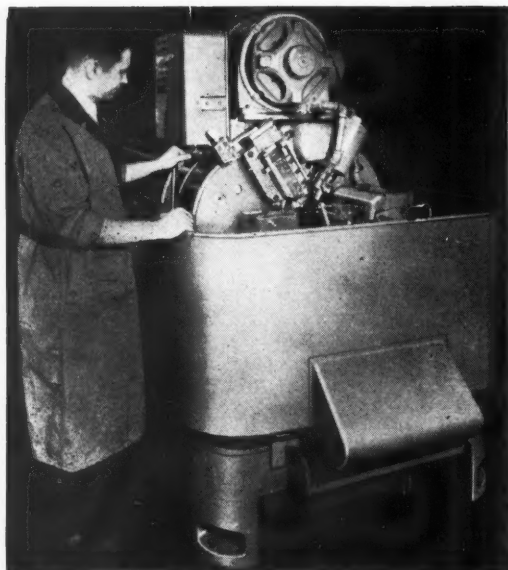


CHICAGO *Rawhide* **MFG.CO.**

1207 ELSTON AVENUE

CHICAGO 22, ILLINOIS

Other C/R maintenance products are: round, flat and twist belting; belt pins and belt lacings; gears, pinions and gear blanks; aprons and hand leathers; hydraulic packings.



Acme-Gridley Model SST Single Spindle Automatic

where simple operations such as turning, forming, straight, or taper boring, and cut-off are required in mass quantities has been placed on the market by The National Acme Co., 170 E. 131st St., Cleveland 8, Ohio. According to the manufacturer, the machine provides advantages of simplicity in construction combined with strength and stability suited to the application of high speed or carbide-tipped tools for high precision tolerances at unusually high output rates.

The heavy work spindle is supported in a double anti-friction bearing at each end and is direct driven by means of sheaves, V-belt connected to the motor. By changing sheaves, spindle speeds from direct down to 900 r.p.m. can be obtained with a 1,800 r.p.m. motor; with a 1,200 r.p.m. motor, down to 600 r.p.m.

131 Steel Press Brake are as follows: capacity, 11 tons; working length, 48 inches; distance between housings, 31 inches; die space (stroke down, bed adjustment down), 6 inches above lower die holder and $7\frac{1}{4}$ inches above bed; adjustment of bed, 3 inches; stroke, 2 inches; strokes per minute, 25-60; motor, $\frac{1}{2}$ h.p., 1,800 r.p.m.; and weight, 1,650 pounds.

The forming slide is an angular type, supported well back into the heavy frame column. The end working slide is a combination type from which straight or taper boring and outside radial turning can be performed simultaneously. The turning slide is equipped with a relieving cam to avoid any tool drag on the work as the slide recedes. The cut-off slide is mounted on the face of the frame and is lever operated directly from the main cam shaft. The stock stop is connected to the cut-off slide so that when the latter recedes, the stock stop automatically slides into stock gaging position.

The feed mechanism which controls the cam shafts, drums, and cams operating the slides and stock feed stop is gear

Acme-Gridley Model SST Single Spindle Automatic

Designated as the Acme-Gridley Model SST, a single spindle automatic designed especially for making parts from tubing

AIRLOX

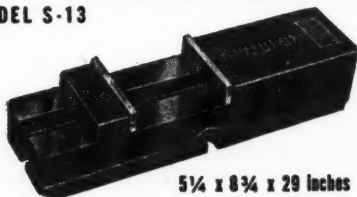
PNEUMATIC and Hydraulic Vises

Jaw force: 90 times air-line pressure

Write for Data Sheet T

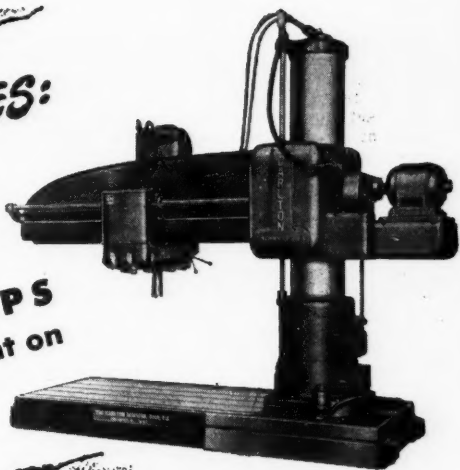
production devices, inc. Whitehall, New York

MODEL S-13



5¼ x 8¾ x 29 inches

CARLTON SUPPLIES:
RUTHMAN
GUSHER
COOLANT PUMPS
as standard equipment on
their radial drills.

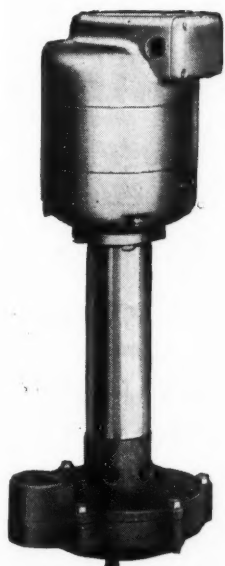


*Photo Courtesy
The Carlton Machine Tool Co.
Cincinnati, Ohio*

Yes, more and more of the leading machine tool manufacturers all over the country supply Ruthman Gusher Coolant Pumps as standard equipment on their machines. They have learned from experience that Ruthman Pumps give their customers long service, low maintenance costs and efficient operation at all times.

So follow the leaders in the industry, specify Ruthman Gusher Coolant Pumps on your metal-cutting machinery.

Illustrated above is a Carlton Radial Drill equipped with a Model UL Immersed type Gusher Coolant Pump.



THE RUTHMAN MACHINERY CO.



1817 Reading Road

Cincinnati 2, Ohio

driven from the main spindle. Feed control is effected through a standard disc clutch and lever. As a convenience and safety feature useful to the operator when setting up the machine, or in the event of a tool jam, a push button is provided which allows the operator to throw the feed lever to engage a reversing clutch which returns the slides to their retracted positions and frees the tools in a fraction of a second.

In the 2 and 3-inch capacity sizes, stock is fed by a cable, spring, and pusher bar which are always under tension so that the stock is fed the instant the collet opens. Each of these sizes is equipped with a standard stock feed mechanism for tubing lengths up to 16 feet. To conserve floor space and time in handling and loading stock, the Model SST is equipped with a stock tube which is made in half sections. The upper half of the tube is swung upward manually, allowing the stock to be rolled into the lower section, after which the upper section is manually closed and automatically locked. The stock pusher bar is not removed while loading, since it slides back automatically far enough to permit the stock to roll into the tube.

The stock feeding operating mechanism consists of a switch controlled reversing

motor-driven gear unit in connection with a cable and spring which return the stock pusher bar to its original position ready for the operator to load stock as soon as the last piece is fed. The motor is provided with a roller clutch and reduction unit which retard the force of the spring feed action so that the stock contacts the stop without shock. In sizes of the Model SST with capacities for tubing from 3 to 12 inches in diameter, an open type electric feeding device is employed.

Black & Decker No. 6 Universal Valve and Tool Grinder

The Black & Decker Manufacturing Co., Towson 4, Md., announces the addition to its line of valve reconditioning equipment of a universal valve and tool grinder designated as the No. 6. The machine is also said to have many applications for production or machine shop tool grinding.

According to the manufacturer, the Black & Decker Universal Valve and Tool Grinder is designed to handle flat head and 15-degree valves quickly and easily without special attachments or difficult adjustments. The unit has a capacity for



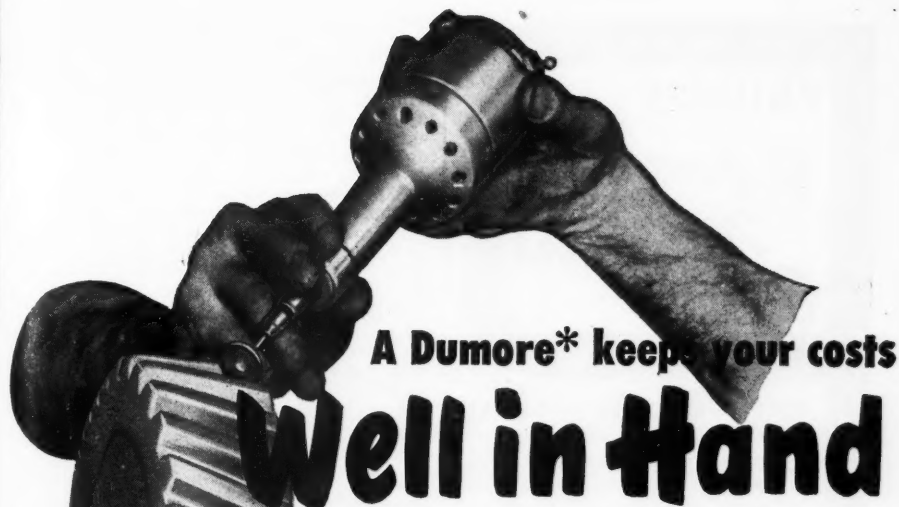
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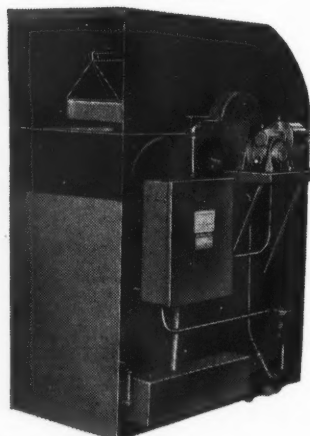
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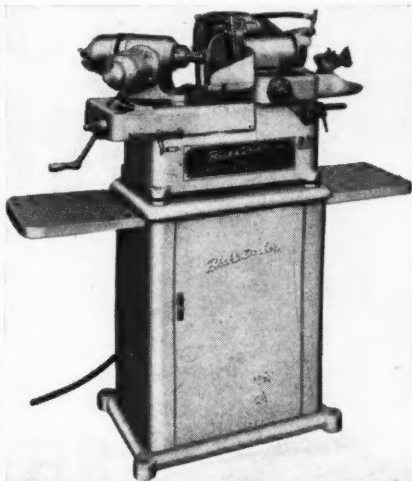
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valve stems ranging from $\frac{1}{4}$ to $1\frac{1}{4}$ inches and valve heads up to $5\frac{1}{4}$ inches. Equipped with a double-end wheel spindle, the machine can be used in quickly grinding rocker arms, valve stems, and tappets with the aid of attachments which are standard equipment. Outstanding features of the machine include an air chuck which is designed to instantly grip or release the valve stem with the flick of a finger. The design also includes a controlled speed workhead motor which is quickly adjustable to accommodate large and small size valve heads. A



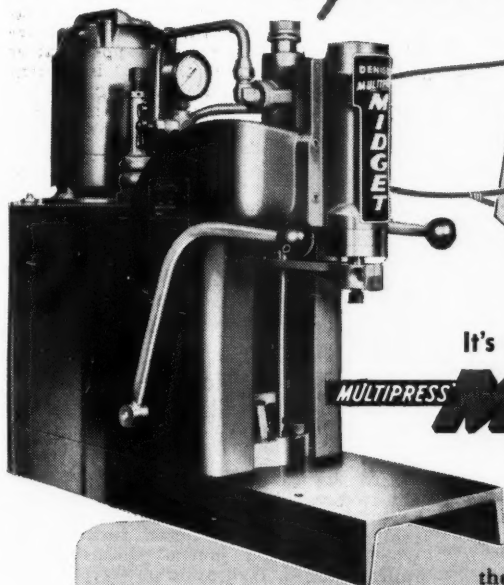
Black & Decker No. 6 Universal Valve and Tool Grinder

switch slide bar automatically controls the workhead motor so that the motor operates while the valve or tool is being ground and stops when the table moves away from the wheel.

Ruggedly built, the grinder incorporates a heavy gauge steel base of welded construction rubber mounted on a heavy duty steel cabinet, included as standard equipment. Cylindrical grinding and sharpening operations on cutters and reamers can be readily performed on the machine. If desired, the wheel head assembly can be removed and replaced with special grinding attachments such as an internal grinding attachment. The wheel head carriage is movable for grinding large diameter straight type tools such as reamers, circular punches, and dies. Standard equipment of the machine in-

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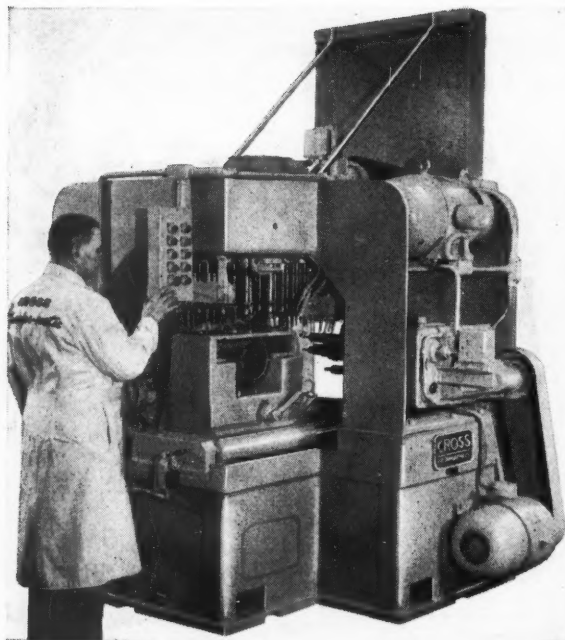
the same exact, preset pressure on the work—regardless of part size variation. There is no dependence on operator skill or "feel," and unskilled operators turn out high, reject-free production. Ram stroke, speed and pressure are all easily adjusted by controls at the operator's fingertips.

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Cross Special Tapping Machine

Co., Detroit 7, Mich. The work cycle is automatic and push-button controlled. When the button is pressed, 25 holes are tapped at Station One. An automatic shuttle then conveys the part to Station Two, where 35 more holes are tapped, after which the part is returned for unloading.

Each tapping spindle is equipped with an individual lead screw feed, with a safety device to eliminate tap breakage if holes have not been drilled in the previous operation, and with a lubricating system, which provides a measured amount of oil with every cycle.

Morey Automatic Railroad Axle Lathe

Product of the Morey Machinery Co., Inc., 4-57 26th Ave., Astoria, New York 2, N. Y., the automatic railroad axle lathe shown herewith is a hydraulically operated electronically controlled machine tool for rough and finish turning the wheel seats and journal diameters of railroad axles. Hydraulic power provides for all chucking, clamping, feed, and traverse movements.

An end-drive chucking method is used to hold the axle by hydraulic pressure from the tailstock quill toward the headstock spindle, transmitting the power

cludes five twin-grip collets; collet push rod and nose piece for small valves; rocker arm grinding attachment; diamond wheel dresser; cutter type wheel dresser; micrometer valve stem grinding attachment; and universal depth gage.

Cross Special Tapping Machine

A special tapping machine which is designed to tap 60 holes in an automatic transmission case at the rate of 65 pieces hourly has been announced by the Cross

FASTER TUBE AND PIPE CUTTING

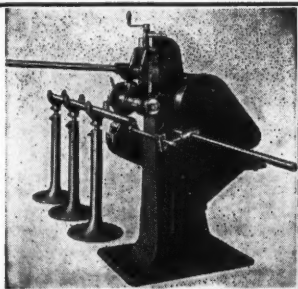
STEEN High-Speed pipe, tube and column cut-off machines embody unique design and rigid construction features to greatly step up cut-off operations. Available in three sizes to cut diameters $\frac{1}{8}$ " to 3"; $\frac{1}{8}$ " to 6"; 3" to 12".

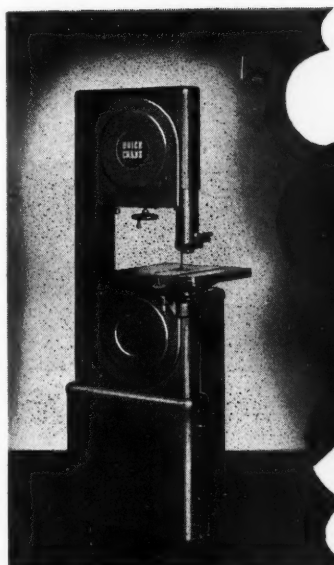
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The Boice-Crane 8-speed multiple purpose band saw is equipped with quick-change gear box and multi-groove pulley drive. An efficient speed is instantly available to the operator for cutting a wide range of industrial materials—iron and steel; brass and copper; aluminum and zinc; brake lining; plastics; building board; fiber and paper; wood and plywood. Also recommended for tool and die work. Our efficient blade butt-welder accessory makes it the equal (up to its capacity) of large die-shop band saws. Cuts up to $\frac{1}{2}$ " thick tool steel and softer materials proportionately thicker.

Precision-built gear box drive contains seven large anti-friction ball, needle, or roller bearings. Quick acting shift-lever and clutch disengages or engages gears. Precision-made helical gears are $1\frac{1}{2}$ " and $\frac{3}{4}$ " wide and have

heavy 12-pitch teeth; transmit as much as one horse-power at lowest speed with a large margin of safety. All gears hardened and run in oil.

The gear-shift lever and V-belt are easily accessible for speed changing through a hinged, spring-latch door. Both oil-filler and oil-drain plugs also accessible through door of drive compartment.

The gear-box unit and motor are both housed entirely within the base cabinet and thereby efficiently sealed off from destructive dust and grit.

Throat Depth: $13\frac{1}{2}$ "

Clearance Under Guide: $8\frac{1}{2}$ "

Table: $15'' \times 15\frac{1}{2}''$. Tilts 45° right, 10° left.

Blades: $3/16''$ to $\frac{3}{4}''$ wide.

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Ft. per Min.—4100, 3260, 2420, 1650, 250, 183, 125, 192.

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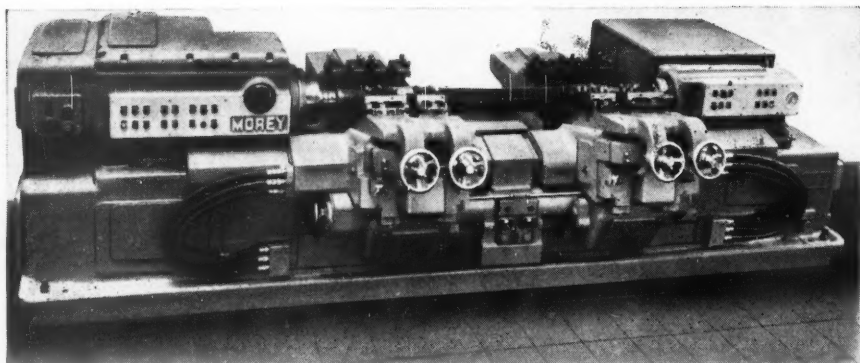
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Morey Automatic Railroad Axle Lathe





through wedge type buttons on the spindle flange. Both centers are of the floating type to automatically compensate for any variation of the center drill in the axle. The chucking pressure is adjustable to meet varying driving conditions up to a maximum of 50,000 lb., and the drive is safeguarded against pressure failure by the use of an electrical pressure switch.

The end-driving chucking method leaves center of machine free for the installation of an automatic loading device.

The unusual rigidity of the machine, which weighs 58,000 lb., enables multiple tooling to be efficiently used with tungsten-carbide tools and is said to assure vibration-free turning of very eccentric forgings. The main spindle drive, includ-

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<p>TUBE DEBURRING CUTTERS (Standard)</p>  <p>18 Standards in H.S.S. and Cemented Carbide</p> <p style="text-align: center;">—●—</p> <p>ADJUSTABLE TYPE</p>  <p>Adjustable from 1/2" - 2-1/2" O.D.—for short runs</p>	<p>TUBE CHAMFERING MILLS</p>  <p>23 sizes from 3/16" - 2-1/2" O.D. — Chatterless</p>	<p>SOLID TUBE DEBURRING CUTTERS</p>  <p>16 sizes from 1/4" - 1-5/8" O.D. — H.S.S. and Carbide</p>	<p>SPECIAL TUBING CUTTERS</p>    
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From light hand-deburring up to close tolerance deburring, chamfering, flaring ... For working non-ferrous metal, steel (including stainless) and plastic tubing ... For combining reaming, sizing or flaring with end facing and deburring ... Whatever the operation or material, Severance HSS and Cemented Carbide Tube Deburring Cutters are TOPS in performance—long life—economy.

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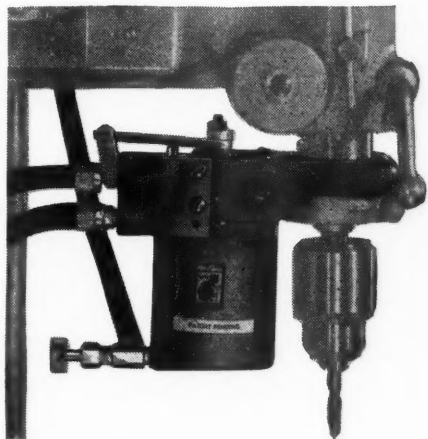
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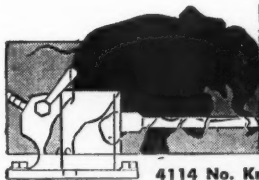
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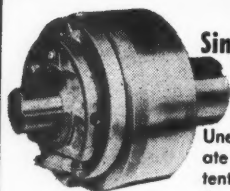
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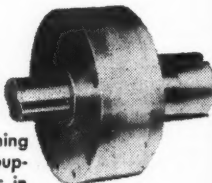
for Industrial Equipment



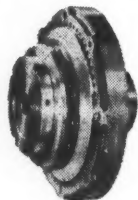
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Reliable spring-loaded slip clutches and couplings available in a variety of types. Outstanding for preventing

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• ELMIRA, N. Y.

ing V-belts, clutch, gears, and anti-friction bearings, is designed to transmit 150 horsepower at continuous duty, allowing for momentary overloads up to 225 h.p. The complete machining cycle per axle requires between 2 and 3 minutes, depending on the size and operation, resulting in a production rate of 200 axles per 8-hour shift.

Close tolerances are said to be maintained on the finished axle due to the rigid design of all toolslides. The slides are hydraulically operated, with positive stops located inside the feed cylinders and equipped with a micrometer dial adjustment which changes the relation between cylinder and slide. An automatic compensating device consisting of a mechanical linkage with a lever ratio of 1:2 connects the tailstock quill to the carriages. This arrangement automatically provides for movement of all cutting tools during chucking to a symmetrical position in relation to the axle, with the result that the width of the end flanges on each axle is said to remain the same on both ends, regardless of the overall length which may vary on different axles.

For the finish turning operation, the machine is equipped with an automatic roller steady rest mounted on the rear carriages. The device turns the dust collars and supports the axle to assure the production of accurately straight journal and wheel seat diameters and to reduce the possibility of chatter marks.

Push button controls are provided for the automatic work cycle, as well as for all individual functions of each machine unit. Due to the length of the machine, the cycle control is duplicated on either end—headstock and tailstock. In addition to these two centralized control panels, the individual controls for each slide are mounted directly on the particular unit which they control so as to make the setup of the machine convenient for the operator. Six adjustable time delay relays are used in combination with limit switches and control relays for the correct sequence of operations.

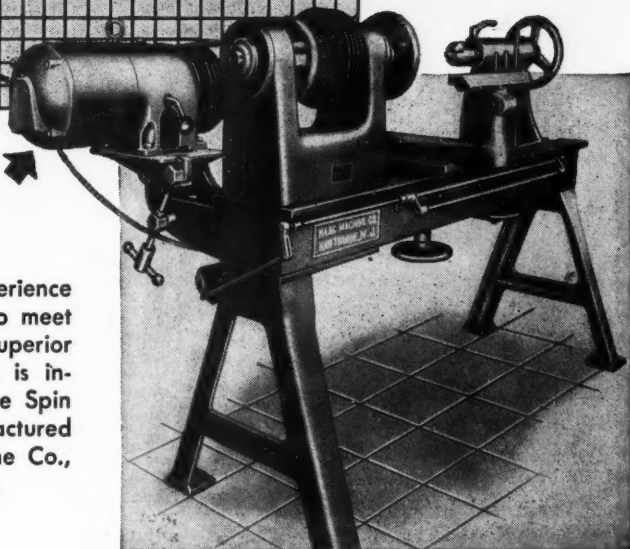
The extra heavy bed is carefully designed for the free flow of chips toward the rear of the machine to an automatic chip conveyor. The hardened and ground ways are covered for protection against scoring. All sliding and rotating surfaces are automatically lubricated from a centralized force-feed lubrication system with metered flow to all points.

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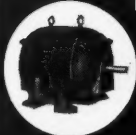
183 FINDLAY ROAD

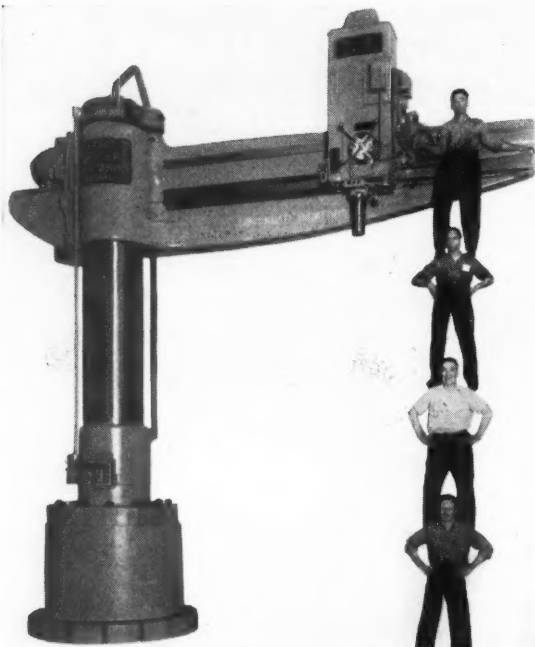
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Cincinnati Bickford Improved 12-Foot Master "Super Service" Radial

Said to have a far greater capacity for the size of work that may be processed underneath it, the Cincinnati Bickford Improved 12-Foot Master "Super Service" Radial shown in the accompanying illustration has been brought out by The Cincinnati Bickford Tool Co., Oakley, Cincinnati 9, Ohio.

According to the manufacturer, the ma-

Cincinnati Bickford Improved 12-Foot Master "Super Service" Radial

chine has a 22-foot overall height and a 14 $\frac{1}{4}$ -foot maximum clearance from the floor to the spindle, which permits work of approximately this maximum height to be handled.

Snyder Special Drilling and Boring Machine

A machine which is designed to drill and line bore cross shaft holes in 70 different sizes and types of clutch housings has been produced by the Snyder Tool & Engineering Co., E. Lafayette, Detroit, Mich. The workpiece is manually clamped in each of two stations on a manually rotated Snyder standard index table which is mounted centrally between the machine slides. The two stations permit drilling and boring operations to be performed simultaneously. The fixtures are provided with vertical slide in-and-out adjustment. Necessary locating holes are also provided for all part locating pins required for the complete range of workpieces.

Four hydraulically actuated Snyder standard slide units are mounted on the machine horizontally and opposed in pairs, front and rear. The slides operate on hardened and ground ways, one flat and one V-type way. The two rear slides are equipped with single spindle drill heads and are used to drill the cross

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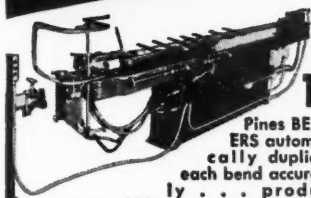


BEWARE OF IMITATIONS

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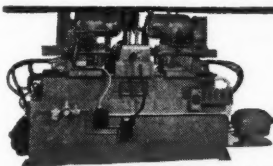
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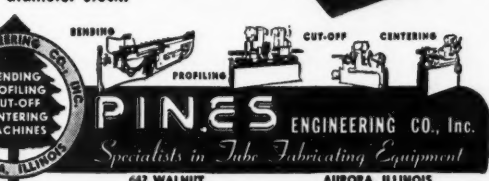
Pines PROFILERS for end-turning, boring, chamfering, threading, tapping, burring, etc. . . single or double spindle operation . . . fully automatic models with feed and discharge conveyors . . . fastest known automatic method of chamfering screw machine stock.

3.

Pines fully automatic CUT-OFF machines produce up to 1500 pieces per hour . . . quickly interchangeable tools, either parting tool bits or rotary cut-off discs . . . capacity from 1/2" to 2 7/8" O.D.

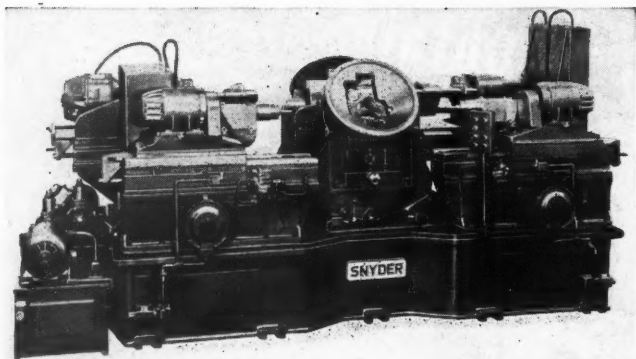


4. Pines CENTERING machine establishes end center holes in either round or square stock . . . simple to operate . . . handles up to 3" diameter stock.



FREE . . . You can obtain more comprehensive information on how you can use Pines pipe and tube fabricating machines to advantage by sending for Bulletin 102D No obligation.

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Snyder Special Drilling and Boring Machine

cated from a pump and tank unit mounted at one end of the machine. Slide feed rates are controlled by individual feed control valves. The machine, which has an estimated production of 65 pieces an hour at 80 per cent efficiency, re-

quires a floor space of 175 x 75 inches and is designed for efficient operation by unskilled workers.

shaft holes. The two front slides are equipped with Parker boring spindles for finish line boring the holes, and are provided with micrometer adjustment to permit precision setting of the finish boring tools, which are of tungsten carbide. The drilling and boring spindles are driven by a Reliance "V-S" drive which permits the spindle r.p.m. to be changed to suit the size of tools being used.

The slides of the machine are lubri-

Fulmer Model 412 Hydraulic Honing Machine

A small size single-spindle hydraulic honing machine designated as the Model 412 has been added to the line of vertical

SPEED for SMALL PART ASSEMBLY

FLOORS slope to feed parts to front — end reaching and fumbling.

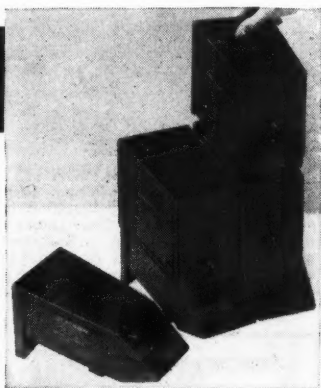
Bins taper toward front to form convenient semicircle—keep all bins within easy reach.

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All-welded construction. Smooth, folded edges.

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Two sizes—tapered or straight sides.



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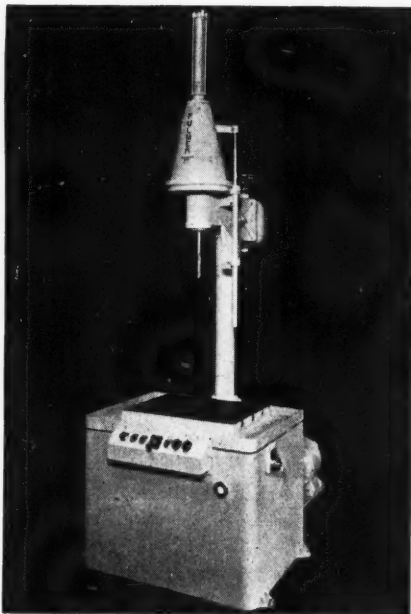


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FOR SPECIAL PURPOSES**

CLEVELAND ELECTRIC MOTOR CO.
5219 CHESTER AVE. • CLEVELAND 3, OHIO

hydraulic honing machines produced by the C. Allen Fulmer Co., First National Bank Bldg., Cincinnati 2, Ohio. The machine is designed for the rapid, accurate honing of any type of internal cylinder ranging from $\frac{1}{2}$ to 4 inches in diameter, such as aircraft and automotive cylinders, sleeves, refrigerator and compressor cylinders, connecting rod bores, bushings, bearing housings, drill bushings, ball bearing races, air and hydraulic cylinders, and so on.

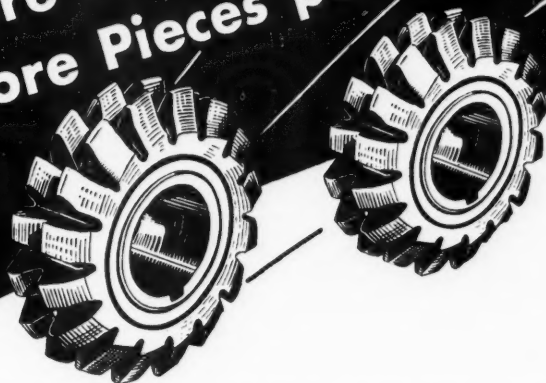
The Model 412 has a maximum honing



Fulmer Model 412 Hydraulic Honing Machine

stroke of 12 inches. Reciprocation is effected by means of a hydraulic cylinder, allowing any reciprocating speed from 0 to 80 f.p.m. regardless of the length of stroke setting. The reciprocating speed is said to be constant through the entire stroke at whatever speed has been set. Reversals at each end of the stroke are smooth and shockless, and the reciprocating mass is hydraulically counter-balanced. Hydraulic power is supplied by a Vickers vane pump driven by a 3 h.p. motor. The use of oversize hydraulic lines and a more than adequate hydraulic reservoir provides for high efficiency of the system.

More Pieces per Grind!
More Pieces per Hour!



WHEN YOUR H.S.S. TOOLS AND FORM CUTTERS ARE HARDENED THE **SENTRY WAY**

Sentry High Speed Steel Hardening Furnaces employing Sentry Diamond Blocks give full hardness to molybdenum, tungsten and cobalt high speed steel cutting tools and high resistance to wear and breakage because the neutral atmosphere produced permits thorough soaking at hardening temperatures without danger of surface oxidization or decarburization. Form cutters remain true to size and shape, no grinding necessary after hardening.

WRITE FOR BULLETIN 1054-E9



See you at the METAL SHOW, October 25-29.
Visit our Booth 413 for a demonstration
of the Sentry Furnace at work.

The Sentry Company
FOXBORO, MASS., U. S. A.



The spindle of the Model 412 is driven by a separate 3 h.p. motor, so that an excess of power is available for any work within the capacity of the machine. The machine has three spindle speeds, obtained through the use of cone pulleys and a heavy duty V-belt, with the output pulley driving a set of alloy steel reduction gears which are mounted on over-size Timken bearings. The gears and bearings operate in a constant bath of oil with oil seal protection against the inclusion of foreign matter. Power is transmitted to the heat-treated alloy steel spindle through an aluminum bronze splined driver. The spindle is $1\frac{1}{4}$ inches in diameter, splined, and has a No. 3 Morse taper in the nose to fit production type honing tools. Any conventional type honing tool can be used.

The working table is 18 x 24 inches in size, with T-slots for $\frac{5}{8}$ -inch bolts, and is so placed that the machine can accommodate workpieces up to 21 inches in outside diameter. The worktable is located at waist height for maximum operator comfort.

Controls for starting, stopping, withdrawing the tools, short stroking, and other functional operations are all located on the front of the machine in the form of a push-button bank. Space is available

in the control bank to accommodate additional buttons for operating the patented Fulmer "Stop and Dwell" mechanism for honing blind holes or automatic fixtures in the event these items should be included on the basic machine.

Underneath the work table is a welded steel base which contains the electrical and hydraulic equipment. A compartment in the base houses the hydraulic reservoir, and in it is mounted the Vickers pump and filter, with the pump motor located at the rear of the machine. Another compartment in the base contains a 45-gallon coolant reservoir. The coolant is delivered to the work by a 1/10 h.p. Ruthman motor-driven coolant pump.

The Model 412 occupies 41 x 48 inches of floor space, is 100 inches in height, and weighs approximately 2,500 pounds.

Brown & Sharpe No. 2 5 H.P. Milling Machine

Designed to provide an unusually great vertical capacity, a No. 50 milling machine standard taper hole in the spindle, suitable spindle speeds for large type cutters, and ample rigidity for using high power, a milling machine with extended



**1 ton radial loads
can't budge tools
gripped in UNIVERSAL
COLLET CHUCKS**

UNIVERSAL ENGINEERING CO.
FRANKENMUTH 9, MICHIGAN

25% Longer Wheel Life

ON GRINDING OPERATIONS

using

BARNESDRIL AUTOMATIC COOLANT SEPARATOR

Example: Norton Grinder

Savings of 25% in wheel life at today's cost levels are a worthwhile investment on any production grinding operation. Add to this a saving of 10 hours a month machine down-time for cleaning and a real cut is made in production costs. These are actual results obtained when a

BARNESDRIL Automatic Coolant Separator was installed on a Norton Grinder, shown above.

Precision, highly finished surfaces are required on the job to meet inspection tolerances. Accumulated grit and fine chips cause the wheel to load up frequently, and often produce rejects due to scratches. Now, all abrasive particles and fine chips are continuously and automatically removed as the used coolant passes through the Separator. Finish is greatly improved, and the machine requires cleaning only once every six weeks.

BARNESDRIL Automatic Coolant Separators are available in capacities ranging from 5 to 100 gallons per minute. They automatically solve finish and clean-out problems in an easy and economical way. Why not ask your **BARNESDRIL** representative for a quotation today?

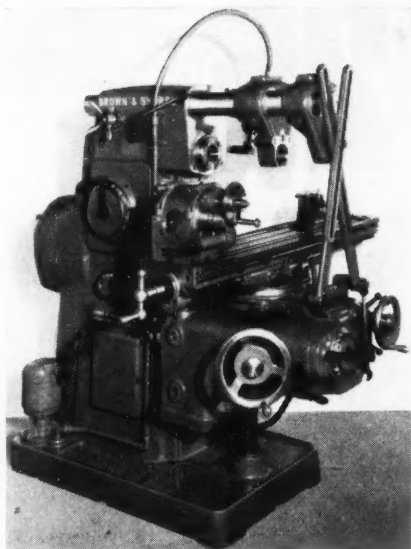
Send for a copy of Bulletin B151E

BARNES DRILL CO.

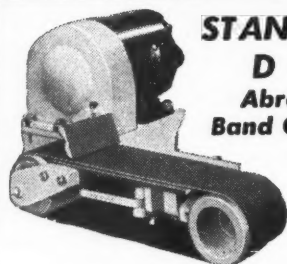
260 CHESTNUT STREET ROCKFORD, ILLINOIS U.S.A.

spindle face feature is now being offered in universal and plain types by the Brown & Sharpe Mfg. Co., Providence 1, Rhode Island.

Designated as the No. 2, the machine provides a full 5 h.p. all-gear drive to the cutter. The cutting feed and fast travel are independently all-gear driven by a $\frac{3}{4}$ h.p. motor synchronized with the spindle motor. A fast travel of 75 inches per minute in all directions is available with the spindle rotating or stopped. A single lever is used to select any of the 18 spindle speeds from 30 to 1,200 r.p.m. Power is imparted to the spindle at all



Brown & Sharpe No. 2 5 H.P. Universal Milling Machine



STANDARD D - 4 Abrasive Band Grinder

Famous
for
Stamina

This new, streamlined bench type grinder assures fast, quality finishing on metals, plastics, wood, fibre . . . at low cost. Built to machine tool specifications, Standard D-4 is equipped with improved band tension control and specially designed protective motor hood. $4 \times 36\frac{1}{4}$ " band. The ideal portable unit.

OTHER STYLES AND SIZES IN NEW
MANUAL ON FINISHING—WRITE TODAY

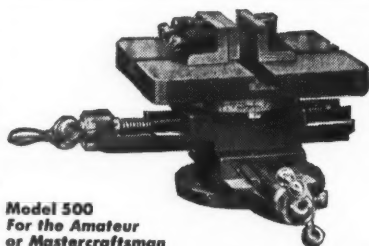
WALLS SALES CORP.

306 E. 38th St., New York 16, N.Y.

speeds directly back of the front bearing mounting. A single lever is also used to select any of the 18 cutting speeds in the range of $\frac{1}{2}$ to $20\frac{1}{4}$ inches per minute, the speeds being uniform in all directions.

The coolant system is operated by a $\frac{1}{4}$ h.p. motor-driven centrifugal pump which is arranged to automatically stop when the spindle stops and may be disconnected by a switch when not required. Fully automatic lubrication is provided for the column, knee, table, saddle, and slides.

According to the manufacturer, the extended spindle face design of the ma-



Model 500
For the Amateur
or Mastercraftsman

MASTERCRAFT ROTARY TABLES

The Mastercraft Drill Press and Milling Table conforms to the exacting standards of best machine tool construction. A great time saver. Cuts keyways, special shapes, splines and innumerable other forms, and drills on a dead straight line or on a radius.

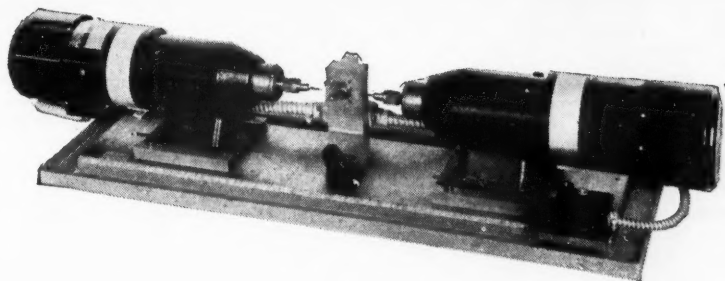
Write for circulars describing this model and 600, 700 and 800 Series for heavier work.

F & M SALES, INC.

1054 CAHUENGA BLVD.

HOLLYWOOD 38

CALIFORNIA



Automatically Tapping Two Opposed Holes Simultaneously



THIS 2-way bench fixture, which we recently designed and built, incorporates 2 Model "KT" Govro-Nelson Automatic Tapping Units which tap two opposed 8-32 holes simultaneously in a metal lamp part (shown on base).

When the part is located by the operator, it actuates a micro-switch, causing both Units to tap simultaneously. Tapping time: One second. Output: As high as 1800 per hour, depending upon operator efficiency.

If you have similar operations, send samples and part prints and we shall be pleased to recommend the proper Automatic Units or quote on a complete set-up. Literature sent upon request.

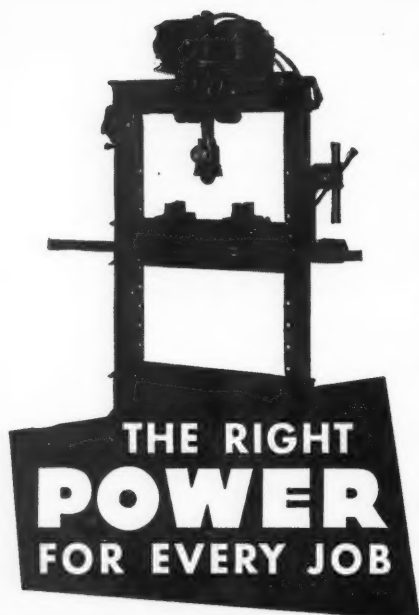
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Literature

GOVRO-NELSON CO.

*Machinists of Precision Parts
for 25 Years*

1933 Antoinette, Detroit 8, Mich.

Automatic **DRILLING UNIT**



LEMPCO Pressurematic Press

... enables you to select the correct pressure for every job: press fitting, assembling, bending, straightening and die try-outs. Pressure builds from 0 to 60 tons in just four seconds. Movable head permits rapid centering of ram over work. Adjustable bolster accommodates large and small jobs. Strong, sturdy construction assures safety factors in excess of the limits of the press.

Lempco Pressurematic Presses are made in electric and hydraulic models, in 20, 40 and 60-ton capacities. Each will pay for itself many times over in your shop. Write for fully-illustrated catalog.



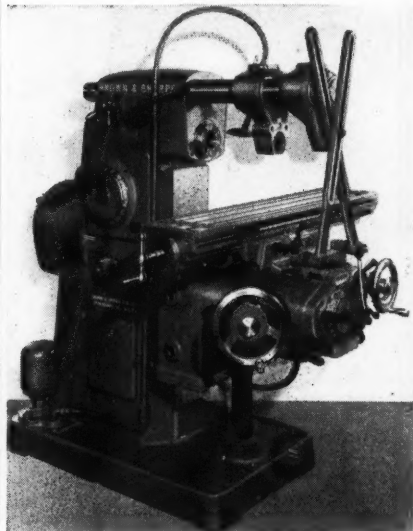
Exclusive

Automatic Pressure Control—stops ram travel at pre-selected pressure. Prevents costly spoilage, speeds assembling operations. Ideal for production line.

LEMPCO

5756 DUNHAM ROAD • BEDFORD, OHIO

chine brings the front spindle bearing near the center of the table, reducing overarm and arbor lengths and providing for unusually rigid cutter support. The ability to mount cutters close to the spindle nose is said to reduce cutter and arbor vibration and cutter wear. The extra sturdy arbor support often permits the use of small arbors using small diameter cutters. When attachments are used on the extended spindle face of the machine, maximum rigidity is said to be obtained with no loss of throat distance.



Brown & Sharpe No. 2 5 H.P. Plain Milling Machine

In both the universal and plain types, the Brown & Sharpe No. 2 5 H.P. Milling Machine has a longitudinal feed of 28 inches, transverse feed of 10 inches, and vertical feed of 16½ inches. The universal type weighs approximately 4,700 lb., and the plain type, 4,400 pounds.

H-P-M Cold Chamber Metal Die Casting Machine

The Hydraulic Press Manufacturing Co., Mount Gilead, Ohio, announces a large, self-contained, all hydraulic cold chamber machine for the production of die castings of aluminum, magnesium, and copper base alloys. Aluminum cast-

from FLAT SURFACES

TO INTRICATE SHAPES



with the New
**DI-ACRO
BRAKE**

- **ROK-LOK**—new sensitive material clamp increases accuracy
- **DOUBLE-EDGED FORMING BLADE** allows close reverse bends
- **NEW PRECISION STOPS** accurately control angularity of bends

This versatile metal forming machine was developed for use in model shops, experimental laboratories and production departments where it often replaces dies for all types of precision forming operations. Di-Acro Brakes will form a great variety of materials including copper, bronze, stainless steel, aluminum and bi-metals.

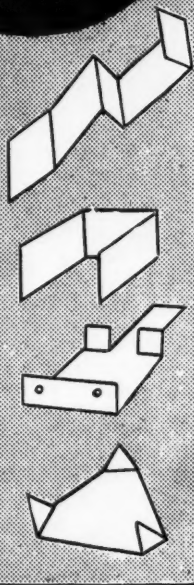
WRITE FOR CATALOG. New edition of 40-page Di-Acro Catalog contains detailed information on all Di-Acro Brakes, Shears, Benders, Notchers, Rod Parters, Punches and illustrates how these precision machines can be used individually or cooperatively for "DIE-LESS DUPLICATING."

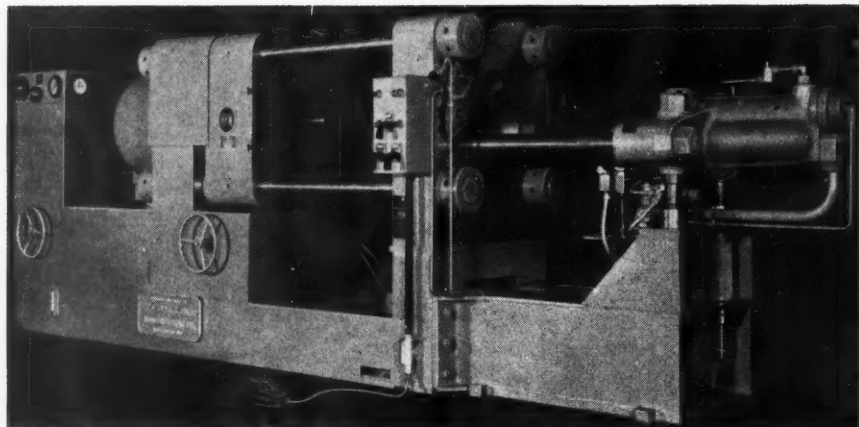
◀ DI-ACRO is Pronounced "Die-Ack-Ro"



O'NEIL-IRWIN MFG. CO.

306 8TH AVE., LAKE CITY, MINNESOTA





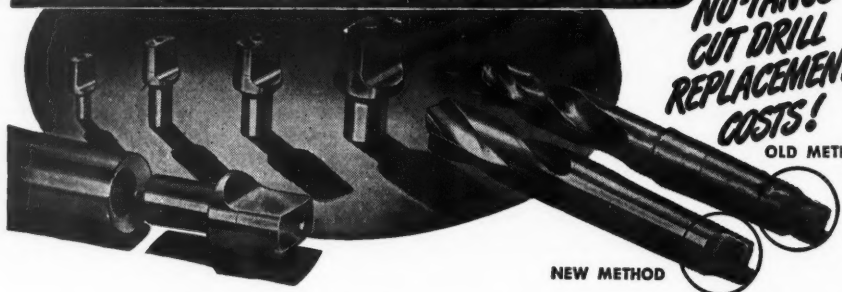
H-P-M Cold Chamber Metal Die Casting Machine

ings weighing up to 10 lb. each can be mass produced with the machine.

Some of the advantages and features incorporated in the machine which were not available in the preceding model are said to be as follows: (1) clearance is

provided below the die space mounting to accommodate core pulls attached to the bottom of the die; (2) this clearance also provides ample room for castings to drop from the die directly onto a conveyor or into a quenching tank, if desired;

NEW DRILLS FROM OLD WITH NU-TANGS



**NU-TANGS
CUT DRILL
REPLACEMENT
COSTS!**

OLD METHOD

NEW METHOD

Send us your old drills—we'll make them new again at a fraction of the cost of a new drill! Exclusive NU-TANG* process replaces twisted or broken tangs with brand new tangs of correct size—and with **GUARANTEED ORIGINAL STRENGTH**. No welding—No distortion—No shortening of drills—No sleeves.

Any drill, reamer, or other tool with a Morse taper in sizes 2 to 6 can be repaired perfectly this quick new way. Delivery—One week. Used by many leading industrial plants. Amazingly low cost—satisfaction guaranteed! Send for complete information.

*Patent Pending.

NU-TANGS INC. 1337 Bates Street
Cincinnati 25, Ohio

*write
today*

YESTERDAY'S PIONEER . . . TODAY'S LEADER



Weldon

Double-End End Mills

IT'S THE TEETH THAT TELL

It's the "teeth" in Weldon End Mills that tell the story of more production and bigger profits on your jobs.

Weldon pioneered in producing *scientifically designed* teeth for end mills, a step over 25 years ago that opened the door to higher speeds, and faster feeds.

After lengthy experiment and study, the

tooth shape and spiral angle on Weldon End Mills were radically altered from conventional styles. The result was a tooth that *allows chips to curl out without clogging and insures better performance and longer life* for the tool.

Call the Weldon representative for more information.

THE WELDON TOOL CO.

*Cleveland 4,
Ohio*



3000 WOODHILL ROAD

(3) the adjustable vertical position of the injection assembly permits injection at either the center line of the machine or 6 inches below center, depending on the part and its gating; (4) injection speed has been doubled from 100 to 200 feet per minute without the use of additional motors; (5) all electrical controls and timers, with the exception of the operating switch panel, have been moved to the end of the machine to protect the controls from the heat and molten metal; (6) the hydraulic power unit and its reservoir for the hydraulic pressure medium are now mounted integral with the machine base

at one end of the machine, thus providing for a considerable saving in floor space and at the same time making the die space accessible from both the front and the rear; (7) new safety features have been added, including combination electric and hydraulic interlock controls which prevent the die clamp from accidentally closing due to electrical switch failure; and (8) handwheels are relocated in the front of the machine where they are readily accessible for adjusting die clamp and injection pressures.

The H-P-M hydraulic die clamp, consisting of a double acting ram equipped

with a small internal booster ram, closes rapidly and provides for positive clamping of the die halves to assure smooth, uniform castings with a minimum of flash and porosity. The die clamps adjustable to any position within the limit of the clamp ram travel, thus permitting the shortest possible opening movement. The die opening and closing are free from shock, thus providing for long die life and a minimum of casting breakage, it is claimed.

The hydraulic injection unit consists of a double acting ram which actuates an injection plunger that delivers molten metal from the cold chamber into the die cavities. An automatic hydraulic ejector located in the movable die platen is said to provide for easy and shockless ejection.

Hydraulic power is available for actuating core pulls. Core movements are controlled by limit switches to

CAPACITY: FROM THE SMALLEST AND FINEST TAP

TO 10-32 INCLUS

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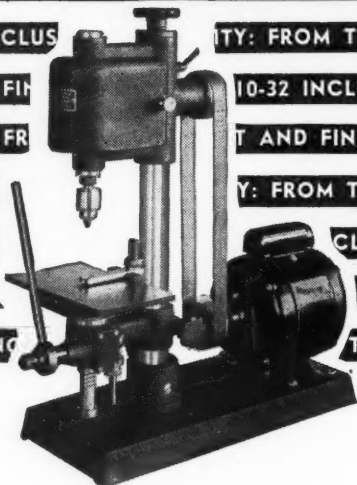
CLUSIVE—

CAPACITY:

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TO 10-32 IN

THE SMA



When tapping operations must be precise, and the materials used differ in characteristics as widely as paper and monel, or ceramics and bronze; then the precision and instrument industries should specify, and demand, the

HAMILTON SUPER SENSITIVE TAPPING MACHINE

Taps to the very bottom of blind holes. Reduces tap breakage to an absolute minimum. Built ruggedly . . . for fast and continuous service on tight production schedules.

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THE
Hamilton

TOOL COMPANY

SUPER SENSITIVE DRILLING MACHINES
TAPPING MACHINES - PORTALVATORS

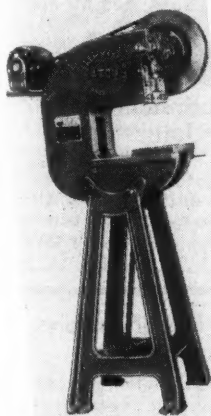
828 SO. NINTH STREET • HAMILTON • OHIO • U • S • A

NEW BENCHMASTER



DEEP THROAT

4TON punch press



- Here's the press you need for punching large sheet steel and other stock in a jiffy. Its deep throat gives extra capacity—now enables punching to the center of a 17½" circle! Extra sturdy frame is heavily reinforced at all stress points. Press weighs 340 lbs.!

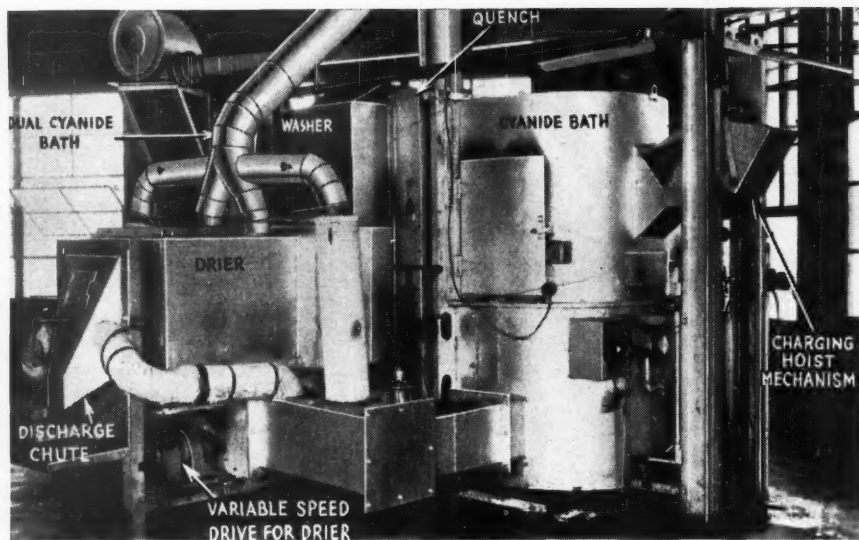
The new Benchmaster retains all the quality, engineering advantages and proven performance features of the standard model—yet gives you CAPACITY seldom encountered in larger presses! Available as a bench model or with legs as a standard extra. Write for MM bulletin giving complete details.

benchmaster

MANUFACTURING COMPANY
3952 WEST PICO BOULEVARD
LOS ANGELES 6, CALIFORNIA



WORLD'S LARGEST PRODUCER OF SMALL PUNCH PRESSES



Dempsey Continuous Salt Bath Unit

assure maximum die protection. The die clamp cannot open until cores are pulled if the die requires this action sequence. The operator starts each cycle by turning the die clamp operating switch. After hand ladling the molten metal into the injection chamber, the injection cycle is started by operating a foot switch. The balance of the cycle is automatic, including "dwell" or chilling time, actuation of core pulling cylinders, die opening, and the ejection of the casting.

The H-P-M Cold Chamber Die Casting Machine has a maximum die clamping pressure capacity of 400 tons. The die platens are 38 x 38 inches in size. The

die space is 23 x 38 inches. The clearance between rods is 23 x 23 inches, and the daylight opening is 42 inches. Ram travel is 16 inches, with a shut height of 26 inches maximum.

Dempsey Continuous Salt Bath Unit

Totally enclosed to protect the operator and to provide for comfortable, cool, safe, and clean working conditions, a continuous salt bath unit for cyanide hardening has been brought out by the Dempsey Industrial Furnace Corp., Dept. L, 133

Producers of SCREW MACHINE PRODUCTS to specifications

We know our equipment.

Can we assist in designing your screw machine products for adaptation to our equipment?

Automatics—2½" Rd. capacity, Turret Lathes—3" Rd. capacity. Castings and Forgings machined to a maximum diameter of 10", length 8", weight 15 lbs.

We are also equipped for Milling, Drilling, Threading and Tapping. May we quote?

SCREW MACHINE SPECIALTY CO.

5637-43 Butler St.

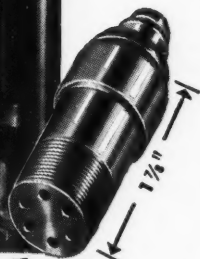
Sterling 2235

Pittsburgh 1, Pa.

"This multiple drill head has increased our torch cone end production by about 600%."



Drilling 6 holes 1 1/2" deep—No. 45 Drill, 28 strokes in 1 min. 10 sec.



⌘ #45 DRILL SIZE

When this MULTI-DRILL went into operation with a seven-station full automatic step drilling machine, welding torch cone end production at the Victor Equipment Co., manufacturers of gas welding and flame cutting equipment, went up "about 600%."

Why not see how your production can be increased with a MULTI-DRILL—the production drilling head designed for accurate high speed drilling? Available with 2 to 8 spindles; quickly and easily adjusted to any hole pattern on or within a 9" circle; 1/2" min. center distances. Drill sizes 1/32" to 3/8". *Special adaptations available.*

Write for details and name of your nearest Distributor

Booth 941, Metal Show, Phila., Oct. 25-29

COMMANDER MFG. CO.
4224 W. Kinzie Street • Chicago 24

Product of *Commander* — Builder of the *Commander Tapper*

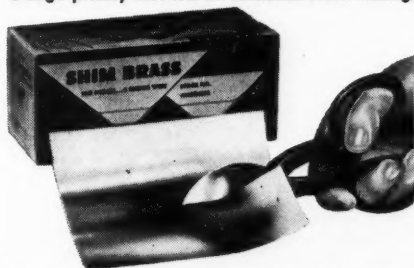
SHIM STOCK!

READY FOR USE WITHOUT FUMBLING OR WASTE...

It's still in the package, still protected, still rolled ...but it's ready for instant use! Just pull the required amount of either brass or steel out of the package slot and snip it off. You're ready for the job!

No fumbling or spoilage with long strips or sheets of easily damaged thin gauge stock. No

problem of protecting your supply between jobs. Gauge plainly marked on container...no miking.



Gauges Available in Dispensing Cartons

	6" x 100" rolls	
.001	.003	.009
.0015	.004	.010
.002	.005	.012

Heavier gauges, .015, .020, .025 and .032", are packed in envelopes containing four flat strips, each 6" x 25". LAMINUM (Reg. U. S. Pat. Off.), the laminated stock that simply p-e-e-l-s off to adjust the gauge, is sold in strips, 2" x 9".

Ask your industrial distributor about Laminated Shim's precision, packaged materials. He has special assortments, conveniently packaged to meet your special needs.

LAMINATED SHIM COMPANY

INCORPORATED

GLENBROOK, CONNECTICUT

Main St., Springfield, Mass. All fumes are said to be efficiently carried off by stacks without entering the room.

Intended for use with neutral or cyanide type salts, the Dempsey Continuous Salt Bath Unit is claimed to be especially suited to the hardening of small parts such as screws, bolts, or other small screw machine parts of various shapes. Relatively small lots of different parts requiring varying cycles for proper hardening can be handled quickly and economically, it is stated. The unit consists of two pot type furnaces, a quench, washer, and drier. Automatic handling equipment, controlled manually, but hydraulically operated, loads the charge into the salt baths and transfers the work through the quench, washer, and drier, finally delivering the work clean and dry into a transfer box or other receiver without manual handling.

The unit has a capacity for charges ranging from 100 to 125 lb. The salt bath temperatures and heating cycle may be varied for each batch as required for best results. The furnaces can be designed to use any fuel—oil, gas, or electricity. When oil or gas is used, the spent flue gases are used to heat the drier. According to the manufacturer, the unit provides for a production of 300 to 500 lb.

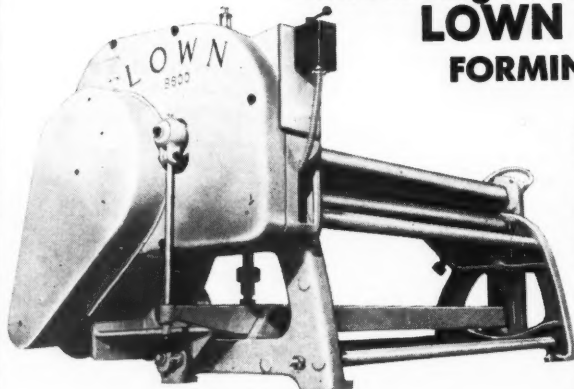
of finished work per hour when cyanide hardening screws to a case depth of approximately 0.003 inch.

Progressive Roller Head Seam Welder

A roller head seam welder is now being offered in three basic sizes—light, medium, and heavy duty—by the Progressive Welder Co., 3050 E. Outer Drive, Detroit 12, Mich. Each size is available in three types for circular welding, for longitudinal welding, or for both circular and longitudinal welding.

Outstanding features of the machine include the use of a head completely guided and aligned by four sets of anti-friction rollers to ensure that the welding wheels will follow up and down even extremely small deviations in material thickness and contour, thus making it possible to maintain constant weld pressures even where stock thickness varies along the seam. The rollers are matched in pairs, adjustable preloaded, and guide the head the full length of its vertical travel, riding on positive alignment V-guides on hardened and ground ways.

Announcing . . . B-600 SERIES LOWN SLIP ROLL FORMING MACHINES



Model B-600 Series—6" diameter

A new, improved, modern design, heavy duty machine, engineered for durability, strength, and service.

SELECT THE BEST . . .
LOWN Slip Roll Forming
Machines are versatile . . .
dependable . . . easy to
operate.

Write for bulletins!

LOWN Slip Roll Forming
Machines are built in a
range of sizes from which
you can choose the exact
unit for your requirements.

SAN ANGELO FOUNDRY & MACHINE COMPANY

SAN ANGELO, TEXAS

1000 E. UPTON

Distributors in Most Principal Cities



Illustration 1/5 actual size

CRATEX

Assortment No. 774

44 Wheels and Points

In various grits and standard sizes for cleaning and polishing, plus three mandrels.

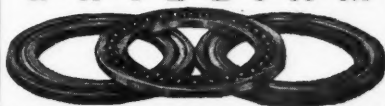
All for \$2.50

CRATEX MANUFACTURING CO.

97 Natoma St.,

San Francisco, Calif.

G WILLIAM



TYPE GB GROOVED RACES BALL THRUST BEARINGS

STANDARD SIZES OR SPECIAL DESIGN to your specifications; send sketch or worn sample, regardless of condition, for quotation, without obligation. • Our complete catalog will help you in making selection of bearings—shall we send it? Also ask for illustrated literature on G William ball thrust and roller thrust bearings.

THE GWILLIAM CO.

358 Furman St., Brooklyn 2, N. Y.

NEW!
from **TIP** to **TOP**

WHALE BRAND SCREW DRIVERS

**AMAZING
NOCOMBO
HANDLE!**



A fine Tool now sensationally improved to bring you greater working ease and power — AND Greater Safety! The new NOCOMBO Handle of extruded Ethyl Cellulose presents no more fire hazard than hard wood! It's stronger than any other plastic Tool Handle ever made! It won't bend when warm or shatter when cold, and it's a superior electrical insulator. The tough Chrome Vanadium Blade is forged in one piece in Round Shank or new Forsberg Reinforced Square Grooved Design . . . stronger than a square blade! Neither type can be turned in or driven into the handle! Your maintenance jobs will benefit by these outstanding features . . . order from your Jobber TODAY!

Send for the new Forsberg Catalog — your guide to greater working efficiency! **WHALE Brand Screw Drivers, Hack Saw Frames & Blades, Coping Saw Frames & Blades, Band Saws, Breast Drills, Hand Drills.**



**SENSATIONAL
REINFORCED
SQUARE GROOVED
BLADE!**

Forsberg
MFG. CO., BRIDGEPORT, CONN., U.S.A.



YOU'RE ALWAYS RIGHT WITH STAR



From the start you'll notice how much faster Star Blades cut metals... and with a truer cut, that leaves a cleaner surface.

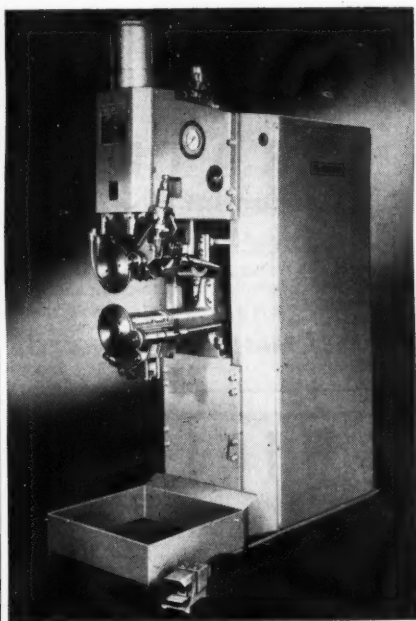
Tough, durable Star Blades lessen "time-outs" on the job, too. You see, every Star Blade is made of finest high-grade steel... precision-set teeth assure fast cutting and full side clearance. You'll appreciate the metal-cutting economies of Star Blades.

Your local jobber or distributor will be glad to help you choose a Star Blade to suit your job, ask him for the NEW Star Wall Chart for your shop... the Star Metal Cutting Booklet for pocket or tool kit—they both contain a world of useful information and are absolutely FREE.



CLEMON
BROS., INC. • Middletown, N. Y.
Makers of hand and power hack saw blades, frames, metal cutting band saw blades and the Clemson Lawn Machine.

According to the manufacturer, the front of the machine column is extremely rigid and well braced, while the rear of the column—where there are negligible stresses—is of fairly light construction designed to provide maximum accessibility to all components inside of the machine. Other machine features include the ability to change over quickly from circular to longitudinal welding and back again; provision of large throat clear-



Progressive Roller Head Seam Welder

ance to accommodate bulky work; transformer close coupled to the welding arms to reduce current loss; specially developed copper alloys to ensure maximum strength where strength is needed; maximum conductivity where this is important; transformer insulated with mica and fiber glass to withstand effectively the high temperatures sometimes developed in high duty cycle seam welding; triple independent water cooling systems with visible outlets; optional straddle or outboard mounted wheel locations; and several optional types of wheel drives.

Moreover, the machine features an exclusive wheel shaft bearing design which

is said to provide for even current transfer while also increasing bearing life and providing maximum facility for service and replacement when required. The right side of the machine is completely clear, permitting the mounting of any type of electric or electronic control units, while the left side comprises a large hinged door panel in which is mounted a recessed sub-panel containing all electric machine controls. All piping in the machine is extended to the outside of the column for simple installation, checking of connections, and moving of equipment. The motor drive unit for the wheels is removable as a complete unit for servicing if required. The entire head is accessible for adjustments, if required, by removing a sheet metal cover. A safety advantage is that drive shafts are non-magnetic and completely insulated. An adjustable-retractable stroke is provided on the machine to ensure minimum floor to floor time in the seam welding of parts.

The Progressive Roller Head Seam Welder may be used either for continuous, water or gas-tight seam welding or for roll-spot welding on cold rolled steel, stainless or other alloy steels, aluminum and other non-ferrous alloys, as well as various types of coated metals.

Behr-Manning Resinall Metalite Cloth Grinding Belt

Resinall Metalite, a heat-resistant cloth type dry grinding belt, has been placed on the market by the Behr-Manning Corp., Troy, N. Y. Utilizing special heat-resistant thermosetting resin adhesives, the belt is said to remain sharp over unusually long periods of use. According to the manufacturer, substantial production increases both in number of pieces per man-hour and in number of pieces per belt have been repeatedly demonstrated on heat-generating operations.

DoAll Utility Band Saw

A 16-inch basic band saw which can be readily converted to perform practically any sawing operation by the addition of accessories and refinements has been introduced by The DoAll Co., Des Plaines, Ill. The shell of the machine is pressed steel, completely enclosing all working parts. The frame is rigid, arc welded over die forms, and is integral with the shell structure. The motor and drive mechanism is isolated by a steel structure. A sawdust chute built into the machine is arranged for emptying from the front.

**OIL HARDENING
NON-DEFORMING**

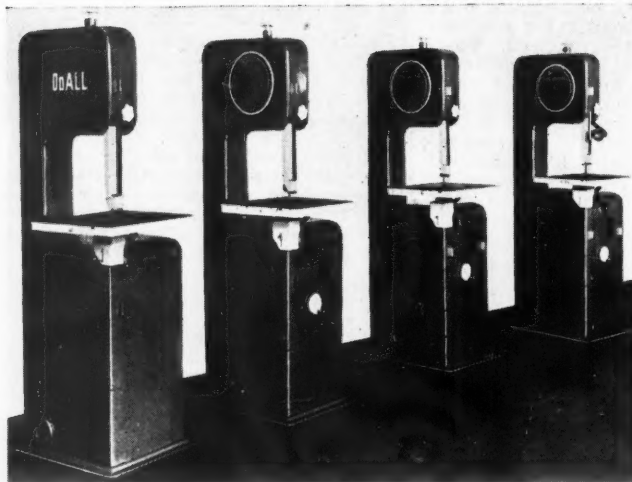
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● **WARPLIS** rods are accurate, truly round, highly polished pieces of top-quality oil hardening tool steel . . . readily machineable . . . free of surface decarb. For your fussy small tools and parts requiring plenty of hardness and toughness, with no appreciable warping or dimensional change.

Genuine **WARPLIS** oil hardening drill rods are obtainable from fine steel distributors and mill supply houses everywhere, same as our water hardening and high speed grades. Send for Pittsburgh's folder on drill rods.

PITTSBURGH TOOL STEEL WIRE CO.
MONACA - PENNA.



(Left to Right) DoAll Models HS, HSV, LHV, and SFP Utility Band Saws

The DoAll Utility Band Saw has a throat depth of 16 inches, work thickness capacity of 12 $\frac{1}{2}$ inches, and table size of 20 x 20 inches, with 45-deg. tilt right and 5-deg. tilt left. The drive wheels are bal-

anced cast aluminum, Neoprene tired, and operate on ball bearings. Access doors at both the front and back of the machine are arranged to swing open at a touch and snap shut. The saw blade tension indicator is calibrated for different saw widths, job selector dials on variable speed models correlate sawing factors to show the best sawing speed for each type and thickness of material being sawed.

The basic machine in the Utility series is the Model HS which has one high set speed or two 4-speed step pulley drive for

CASE REPORT No. 51 from a series of actual cases recording the successful application of BEAR DY-NAMIC BALANCING to industry.

250 to 300 ROTORS per day DY-NAMICALLY BALANCED

—on Bear Balancing Machines at Pezzillo Pump Co. Benefits of Dy-Namic Balancing which they report, can be yours, too, when you use Bear Machines to balance rotating parts. Select the machine that fits your need, from the new Bear Dy-Namic Balancing Manual.



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**Pezzillo Pump Co.
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—reports greater quietness, smoothness of operation and better performance since balancing their rotors on Bear Machines. Approximately a minute and a half required for each rotor. They say Bear Balancing Machines are easy-to-operate, trouble-free, fast in production!

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Wide x 6 1/4" Deep
16 Ga., drag holes,
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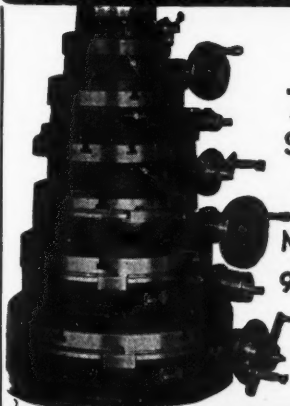


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cutting plastics, wood, and similar materials. The Model HSV has a variable speed range of 850 to 5,200 f.p.m. for the fast, accurate cutting of aluminum, sheet steel, and light structural forms. The Model LHV has both high and low variable speeds (50-300 and 850-5,200 f.p.m.) for cutting all ferrous as well as non-ferrous materials and alloys. The Model SFP has the same speed range as the Model LHV but includes equipment for filing and polishing operations, as well as the welding of saw bands.

To complete the standard equipment of the DoAll Utility Band Saw, rip fences

and circle cutting, mitering and contouring attachments are available which can be utilized to make the machine fit all job requirements. Specialized saw guides are available for such types of blades as precision, buttress, claw tooth, spiral, knife edge, and scallop. The machine can be equipped with either a $\frac{1}{2}$ or $\frac{3}{4}$ h.p. motor.

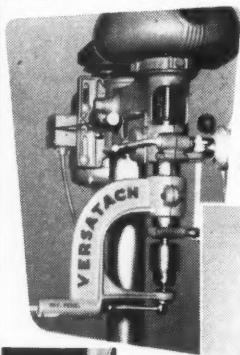
Hamilton-Kruse No. 301 Blank Slitter

Designated as the Hamilton-Kruse No. 301, a duplex body blank slitter designed for plain iron or tin sheets having a maximum thickness of approximately 0.017 inch has been announced by the Lima-Hamilton Corp., 60 E. 42nd St., New York 17, N. Y. The operating speed of the machine is 50 sheets a minute or slower, depending upon requirements. Cutters supplied with the machine are of high-carbon high-chrome forged steel.

The slitter is designed to trim and slit sheets up to 36 inches square into strips on the first unit and then automatically trim and slit the strips into body blanks on the second unit. For cap stock and for blanking bodies of large size cans, the same basic machine, with a different feed arrangement, is said to trim sheets on the first unit and then trim or trim and slit them on the second unit. Sheets are fed from the first operation to the second on the same plane and are fully controlled by automatic hold-downs which are claimed to ensure accurate registry and minimum scrap. The slitter can be arranged for plain material or lithographed sheets, and can be hand fed or operated in conjunction with an automatic sheet feeder.

Floor space occupied by the machine measures 132 x 90 inches, front to back by right to left, including the grinding attachment. The approximate net weight

Now! You Can Cut Internal Keyways on an Ordinary Drill Press Easily and Quickly with the Versatach



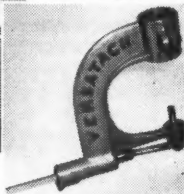
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Saws and Holders are available for \$1.75 each
Additional files in 1/8", 3/16", 1/4", 5/16", 3/8", 7/16" and 1/2" sizes.

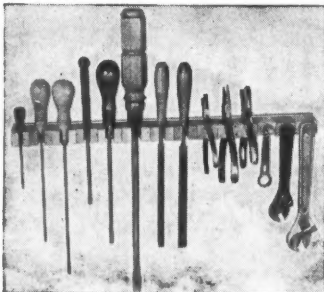
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Price Complete with One 3/16" File and Holder \$29.75 POSTPAID

If additional files are desired add \$1.75 for each file and holder. BE SURE TO FURNISH DIAMETER OF DRILL PRESS SPINDLE QUILL. FULLY GUARANTEED.

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Your workers always have the right tools at their fingertips when you equip your shop with Toolrak. Because the selected hardwood blocks are interchangeable in the extruded aluminum backstrips, you arrange them any way you want, rearrange as often as you wish. Get Toolrak in factory-assembled sets or buy individual blocks and strips to fit your special needs. Send for free folder.

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Write to
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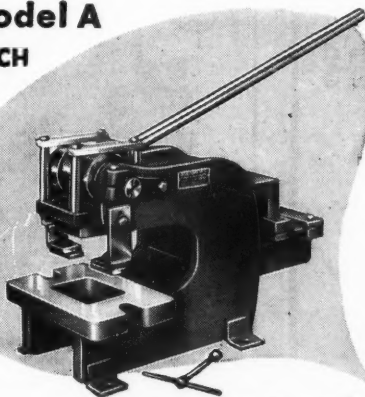
**THE DIE SET
AUTHORITY**



All Baumbach Die-Sets have demountable Leader Pins and Bushings. This exclusive feature permits removing Leader pins for machine work on the die shoe and assures reassembly without loss of alignment. A big time and trouble saver. Write for Catalog.

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Leslie Model A HAND PUNCH PRESS



PRICE
\$120.00

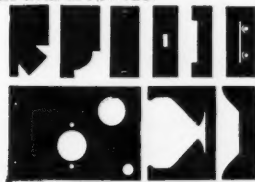
**Eliminate Die Changes...
On Short Runs**

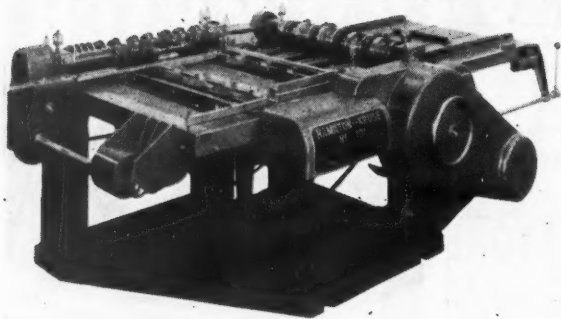
Dealer Inquiries Invited

LESLIE WELDING CO., 2939 Carroll Ave., Chicago 12, Ill.

Large Punch Plate and Bed—6" throat—15 Ton Capacity—accuracy of leader pin die set—all found in the new LESLIE Model A Hand-Punch Press. Why change dies when this compact, easy operating press can take care of your short runs?

Write for complete information
Diagram below illustrates versatility of the LESLIE press—each blanking done with one stroke.





Hamilton-Kruse No. 301
Blank Slitter

Taylor-Winfield "Tri-Phase" Welder

Said to provide a desirable high power factor (95 per cent) at greatly reduced power demand, a resistance welder with three - phase balanced power, to be known as the "Tri - Phase", has been developed by the Taylor - Winfield Corp.,

Warren, Ohio. In correcting power supply difficulties the welder, it is claimed, provides advantages that are very desirable in resistance welding; namely, increased production or unusually heavy welding with present power installation, as well as the production of high quality welds. In addition, the welder is said to provide for reduced electrode wear and pickup, unusually close spot spacing, and minimum sensitivity to work thicknesses.

of the machine, including the grinding attachment, is 7,270 lb. The unit measures approximately 40 inches high from the floor to the top of the feed table.

Both the first and second units are mounted on the same rigid well-reinforced base and are geared in unison. The 3 h.p. individual motor drive unit on the slitter is controlled by start-stop and jog buttons. Thrust ball bearings accommodate the end thrust on shafts, and the bearings themselves are provided with sight-feed oil lubrication.

According to the manufacturer, the Tri-Phase welding circuit permits a wide

Small Precision Pins

**DOWEL - STRAIGHT
COUNTERSUNK - TAPER**

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**Centerless Ground
to $\pm .0001$ " Accuracy**

.030" to .125" Diam.

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Quality Lathe Dogs

Heavy malleable iron. Tail fits face plate slot. Standard Dog has square head screw. Safety Dog has headless screw. Prices are for either style.



Capacity	Price*	Capacity	Price**
1/2"	\$0.85	3/8"	\$0.75
3/4"	1.00	1/2"	.80
1"	1.10	3/4"	.85
1-1/4"	1.25	1"	1.05
1-1/2"	1.50	1-1/4"	1.15
1-3/4"	1.65	1-1/2"	1.45
2"	1.80	* 13-inch or larger lathe.	
2-1/2"	2.05	** 9-inch and 10-inch lathe.	
3"	2.30	f.o.b. factory	
3-1/2"	3.15		
4"	4.25		

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60,000 RPM



"UTILITY" Pneumatic GRINDER

A powerful tool, streamlined in design, easy to handle. Designed for real production work and the toughest jobs. Precision made. Speed such as to operate Tungsten Carbide Burrs, Rotary Files, etc., to their full efficiency. Special grease-sealed bearings. Fitted with steel housing, a special safety feature.

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HERE IT IS!



"SET
YOUR
OWN"

ADJUSTABLE

Precision machined from properly
hardened materials to give
accurate life-time service.

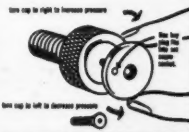
TORQUE THUMB SCREW

5 TO 50 POUNDS END PRESSURE...

In response to industry's demand for a Torque Thumb Screw that will not only hold during machining, but one which tool engineers can set themselves, to meet the requirements of many jobs, the Vlier Adjustable Torque Thumb Screw, with its wide range of 5 to 50 lbs. end pressure, presents the greatest boon to economical production ever offered. Setting the Vlier Adjustable Torque Thumb Screw is simple. Once set, the pressure will remain constant under all working conditions, assuring accurate holding tension, avoiding work distortion, preventing costly rejects and expensive fixture rework costs.

A trial will convince you the Vlier Adjustable Torque Thumb Screw is a "must" in your tooling operations.

Adjustment is made by
simply removing center
head screw, allowing
rotation of adjuster-cap,
which turns hex key,
regulating pressure.



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for representatives as special dis-
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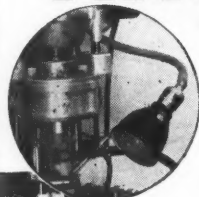


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LIGHTER MODELS UE and UE-2

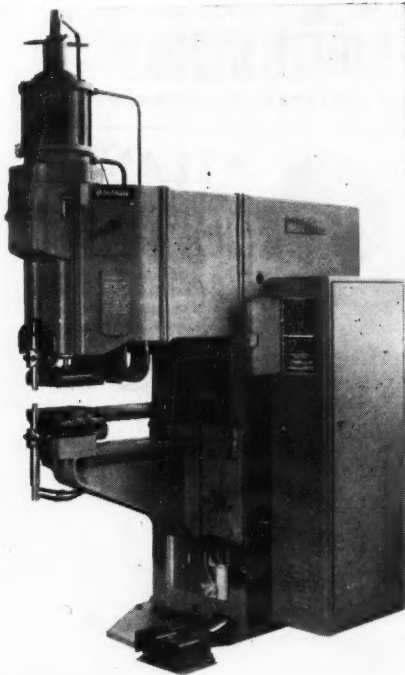
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Hillside, N. J.

range of shapes and sizes of work to be welded, especially in deep-throated welder models. Welding currents are said to be essentially constant when magnetic work or fixtures are moved into the work area. The same applies when work clearances vary, it is stated.

The Taylor-Winfield Tri-Phase Welder is designed to produce high quality welds



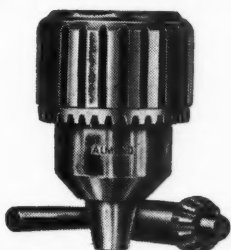
Taylor-Winfield "Tri-Phase" Welder

in a wide variety of materials, including low carbon steel, stainless steel, aluminum alloys, magnesium alloys, Monel, Inconel, brass alloys, and so on. The machine may be obtained in spot, seam, projection, and upset-butt types.

Milwaukee Model FS Die Filer

Designated as the Milwaukee Model FS, a bench type reciprocal filing machine which is said to perform the three die-making operations of filing, sawing, and lapping without changing overarms is

ALMOND DRILL CHUCKS



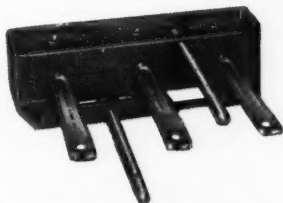
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Extreme Accuracy and
Long Life.**

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COOK

3 in 1 Lead Hammer Mold!



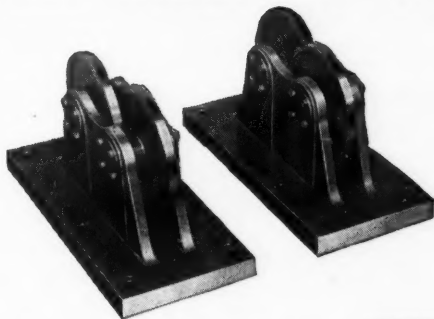
Makes three lead hammers as fast as ordinary molds make one!

Expressly designed to mold hammer heads in 3, 4, 5 or 6-lb. sizes around **COOK SHUR-GRIP HAMMER HANDLES** . . . the drop forged handles that mean certain safety! Just close lid, pour and **PRESTO** . . . three hammers are molded! Ask for literature and prices!

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65 MASSASOIT AVENUE
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PILLOW BLOCK BALANCING WAYS

Especially suited for large diameter work, as a sub-base can be made of proper height to give necessary clearance for work. Anderson Pillow Block Balancing Ways are precision built with chilled iron discs which rotate with minimum friction on sensitive special bearings. Many manufacturers have endorsed them for profitable, efficient, static balancing.



**Built in 1000, 2000, 5000, 10,000
and 20,000 Capacities**

Write for Bulletin 10-22

ANDERSON BROS. MFG. CO., Rockford, Ill.

**Balancing Ways, Roto Checkers, Hand and Power Scrapers,
Spotters, Hand and Power Hydraulic Straightening Presses.**



now being manufactured by the Rice Pump & Machine Co., 1024-D S. 40th St., Milwaukee, Wis. The design of the machine features a deep-throated all-purpose overarm equipped with an upper chuck in the overarm assembly which permits files, saws, or lapping sticks to be chucked at the upper as well as the end of the unit. The spring tension on saws and thin files can be readily adjusted by moving the overarm chuck assembly up or down. Another advantage which is said to be provided by the overarm assembly is the fact that it permits chucking close to the workpiece, thereby

AMAZING!

THE WAY THESE METAL SCRAPERS GIVE FINER FINISHES FASTER



Forthman scrapers tipped with CARBOLOY Cemented Carbides stay sharp far longer than steel scrapers, permit finer finishes, and save on scraping cost per piece. Write for FREE Folder.

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CARBIDE

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HIGH SPEED

COUNTERSINKS

- Shear cutting action
- Speedy—for air-tested seats
- Materials—up to 63-C hardness

17 stock sizes up to 2" diameter
30° 41° 45° and 60° angles with C/L
Shanks—plain, tang drive, tapers

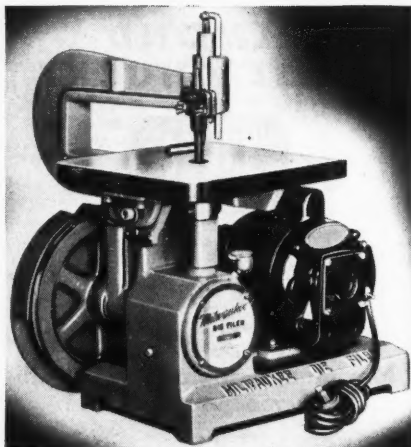
ENGINEERING SERVICE

Write for Bulletin 15-C

SEVERANCE TOOL INDUSTRIES, Inc.

724 Iowa Ave.,

Saginaw, Michigan



Milwaukee Model FS Die Filer

assuring maximum rigidity of saws and files.

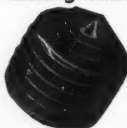
The lower chuck is an additional feature of the machine which is claimed to promote precision workmanship. A ball joint permits accurate alignment of files with warped, crooked, or twisted shanks before they are rigidly clamped in working position, it is claimed. Caps having serrated faces with V-grooves firmly grip and align files, saws or stones of any size or shape.

The all-purpose overarm of the Milwaukee Model FS can be instantly released and swung clear of the table for frequent and quick inspection and checking of the workpiece. An adjustable stop is said to assure immediate return of the overarm to the original setting. The work table is mounted on two brackets and may be tilted 15 degrees in four directions for the



A REAL HELPING HAND

It's a help that die makers, tool makers, machinery builders and general machinists have long sought—a more accurate and surprisingly faster way of transferring blind screw holes.



The Heimann Transfer Screw Set is a self-contained, complete tool. No wrenches or pliers are necessary. Made in $\frac{1}{8}$ " to 1" diameters. Send for price list.

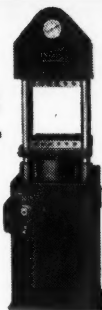
HEIMANN MFG. CO.

330 Lincoln Ave.

Urbana, Ohio

HYDRAULIC PRESSES

General
Purpose
Press
(Bulletin
370-C)



SPEED PRODUCTION REDUCE COSTS

When you need presses for:

Blanking	Forging
Piercing	Coining
Flanging	Embossing
Bending	Hobbing
Forming	Die Sinking
Drawing	Extruding

Assembling Testing
or for
General Purpose Work

Look into the many features of Watson-Stillman's full line of Hydraulic Presses. Write for information about presses for **YOUR** job.

WATSON-STILLMAN

225 ALDENE ROAD

ROSELLE, N. J.

"OLIVER" 30-inch Metal Cutting BAND SAW

Has low speed geared head direct connected to lower wheel for cutting risers, gates, sprues.

Also furnished with high speed motor for sawing compositions, woods and sheet metals.

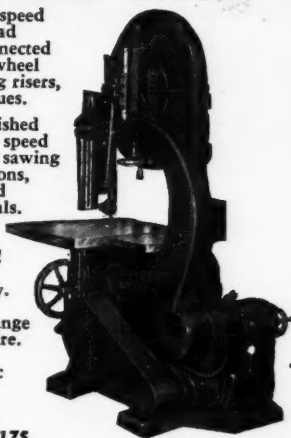
Powerful!
Cuts true and steady.

Quick-change rim and tire.

Automatic brakes.

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Bulletin 2175

Oliver Machinery Co., Grand Rapids 2, Mich.



HOW TO GRIND CARBIDE CUTTING TOOL BITS ECONOMICALLY

Here's tool grinding at its best!



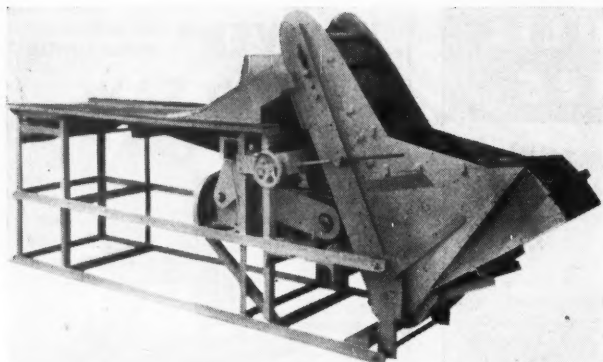
Employing 3-step progression—rough, semi-finish, and finish or hone—on one machine, this LeMaire 3-Wheel Grinder produces keener edge in fraction of time. Because tools go to diamond wheels in better condition, life of diamond wheels is considerably lengthened. Both labor and wheel costs are reduced—time is saved—production is increased.

Wouldn't you like to know more about this remarkable 3-Wheel Grinder? Send for descriptive folder.

LeMaire Tool & Mfg. Co.

2657 S. Telegraph Road
Dearborn, Michigan

Designers and builders of unit and way type machines for single or multiple spindle drilling, boring, reaming, tapping, etc.—Twin Ram Hydraulic Units—Match-fit Gear Chucks.



Prutton Inspection Table

the D. H. Prutton Machinery Co., 5295 W. 130th St., Cleveland, Ohio. The unit includes an elevator hopper which is arranged to feed any small mass-production item onto a 2 x 8-foot conveyor belt for visual inspection. A multi-speed transmission and variable angle control allow for any desired distribution of

accurate filing or sawing of compound angles. Adjustable hold-down fingers are said to hold the work flat against the work table in any desired position.

the work on the table.

The Prutton Inspection Table requires a floor space of 48 square feet and is built so that all moving parts are readily accessible.

Prutton Inspection Table

An inspection table designed for the inspection of small parts, such as nuts, bolts, washers, and so on, at rates up to 130,000 pieces per hour is announced by

Natco Drill Testing Machine

To enable a prominent drill manufacturer to test the durability of its tools, the National Automatic Tool Co., Inc.,

DON'T WAIT UNTIL TAPS BREAK OFF — and then wish you had a set of WALTON Tap Extractors

**Have them on
hand for this
emergency.**

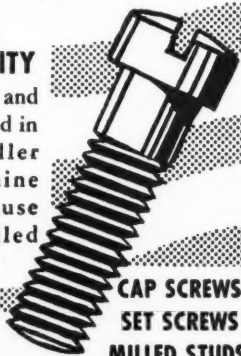
**Remove
Broken Taps
Quickly and
Easily.**

**Write for folder
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OFFER.**

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Hartford 10, Conn.**

CONCENTRICITY

of head, body and thread is assured in every Ottemiller Screw Machine Product because they're "milled from the bar."



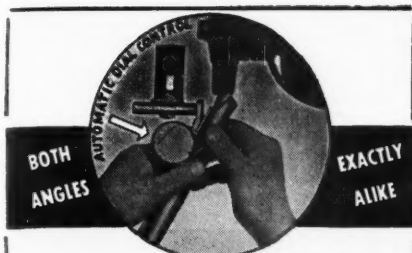
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WRITE: Wendt-Sonis Company, Hannibal, Missouri; 580 North Prairie Ave., Hawthorne, Calif.; 1361 West Lake St., Chicago, Ill. Warehousing Facilities: Eastern Carbide Corp., 909 Main St., New Rochelle, N. Y.



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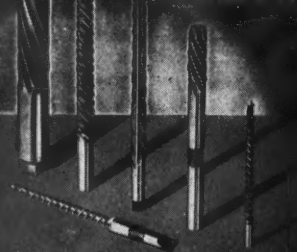
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The Gammons Helical Chucking Reamer
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Special reaming problems solved

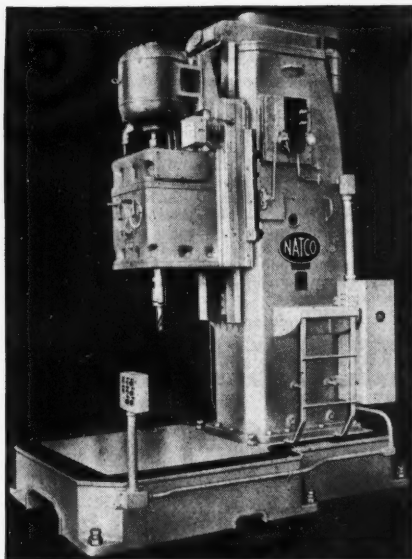
THE GAMMONS-HOAGLUND CO.

MANCHESTER

CONNECTICUT

Dept. 27, Richmond 27, Ind., has developed the heavy duty hydraulic drilling machine illustrated herewith which is designed to operate at peak efficiency under abnormal or overloaded conditions.

To accommodate unusual stresses and loads at various speeds, the machine is equipped with a heavy duty single spindle 7-speed geared head. A 30 h.p. motor maintains a synchronous speed up to the rated horsepower when drills become



Natco Drill Testing Machine

dull. As the load builds up to a predetermined value, a torque limiting device operates to stop the motor. A shear pin arrangement is also provided to prevent the destruction of gears in the head in the event of serious overloading.

A range of 42 different speeds is available through the use of change gears. The machine features a rugged frame construction to provide maximum rigidity to the column, head, and spindle.

Elwell-Parker Low-Lift Platform and Crane Truck

Said to be effective for many load-handling operations in manufacturing, warehousing, and shipping, a power industrial truck combining a low-lift platform and



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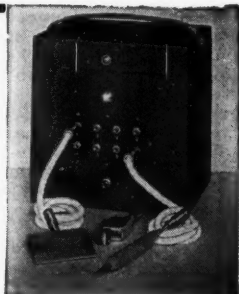
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• The Hjorth Lathe has the speed, accuracy, handling ease and dependability that appeals to every operator. That's why you'll find the better shops equipping with the Hjorth Lathe.

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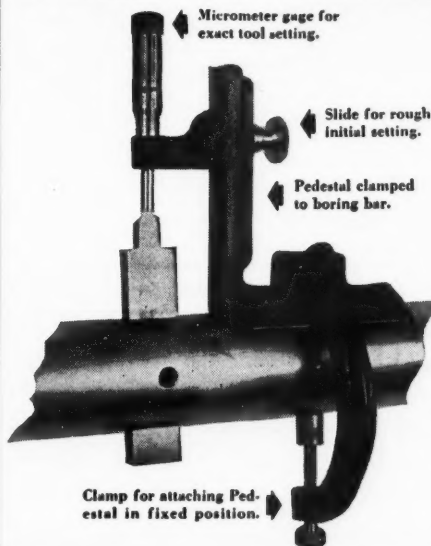
• Write for circulars and prices.

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Micrometer gage for
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Slide for rough
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Pedestal clamped
to boring bar.

Clamp for attaching Ped-
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... AND WORK-SAVER, TOO!

The Bartelt Pedestal Micrometer

Enables you to set boring tools accurately from the bar diameter—eliminates common cut-and-try methods. Permits quick micrometer height measurements from flat or round surfaces. Can be used as a production-inspection tool with a wide range of settings. Ideal for jobbing shop and toolroom mechanics. Quality construction, moderately priced—sold direct-to-you by the manufacturer. All components precision machined of high grade materials and carefully assembled. Packed in carrying case with necessary accessories. Made in eight models for various applications. Write today for literature and direct-to-you prices.

BARTELT ENGINEERING CO.

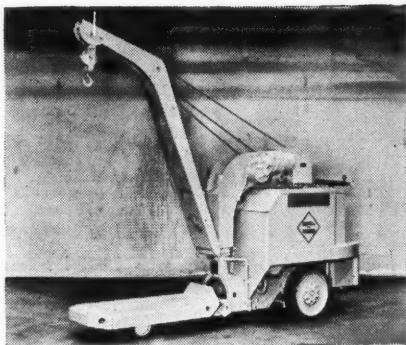
1216 Partridge Ave.

BELOIT

• WISCONSIN

a crane is announced by The Elwell-Parker Electric Co., 4205 St. Clair Ave., Cleveland 14, Ohio. The crane is designed to pick up a load from floor level and lift it to a hook height of 8 feet within a radius of 45 degrees either left or right from the base. Its shape and mechanism provide a means for reaching, high-stacking, or taking down raw materials or finished products in such form or package that they may be handled with rope or cable slings.

The platform of the truck is designed to lift and transport loads weighing up to 3 to 5 tons, depending upon the size and



Elwell-Parker Low-Lift Platform and Crane Truck



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**For Flat Bars
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Wire Rope**

MADE IN THREE SIZES:

The sturdiness and dependability of these cutters reflect our more than 50 years of experience.

T. H. LEWTHWAITE MACHINE CO.

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NEW YORK 17

model. Loads may be piled directly on the truck platform or on skids under which the platform can be maneuvered after loading. The crane and platform are operated independently of each other so that the crane may be used by itself at any point any length of time. The boom is of box girder construction and is 8 feet long. Its foot is pivoted on a non-friction bearing-equipped turntable base mounted on the forward end of the truck.

The truck body remains stationary while the operator moves the boom left or right by merely manipulating a lever. Cables which provide further control and which raise or lower the boom and its load are operated by means of a push-button pendant located near the hook. A manually controlled brake on the crane column enables the operator to lock the boom in any overside or central position to avoid swinging of the load during truck operation on uneven floors.

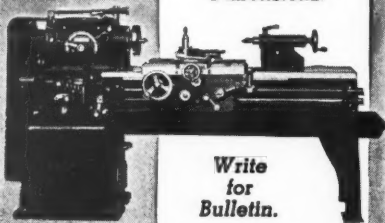
The load-lifting capacity ranges from 1,000 to 2,000 lb., depending on the model.

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**12 Speed Geared
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Timken Mounted
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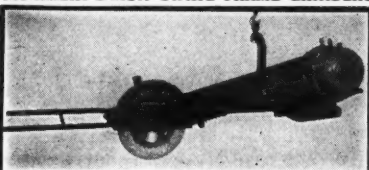
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Sizes 12", 14", 16", 18", 20" and 24" wheels.

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How TO MAKE TAPS AND REAMERS LAST LONGER!

Just because taps and reamers may seem to be worn out is no proof that they really are. It may be that the trouble is not with the tap or reamer itself but rather with the tool holder.

This is where the Ziegler Tool Holder comes in. By compensating for inaccuracies in aligning the work with the spindle, it eliminates the over-size and bell-mouthed holes that are often wrongfully blamed on the cutting tool.

Change over to Ziegler Tool Holders and see how much longer you can keep your taps and reamers in service.



Types to fit any machine used for tapping or reaming.

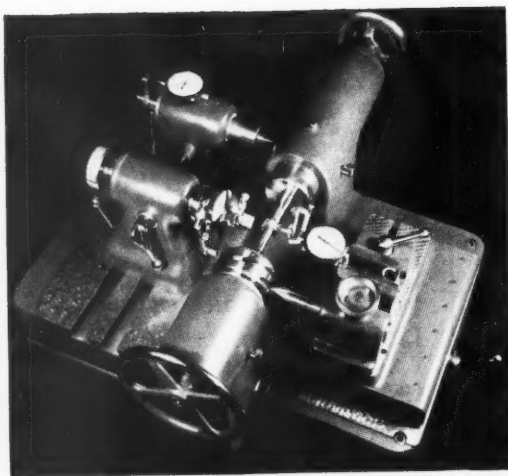


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FLOATING HOLDER
for Taps and Reamers...

1928 TWELFTH ST.
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"Red Ring" Universal Gear Checker

Said to be smaller and more compact, require less floor space, and easier to move from one location to another in the

"Red Ring" Universal Gear Checker

plant than its predecessors, the "Red Ring" Universal Gear Checker shown herewith has been brought out by the National Broach & Machine Co., 5600 St. Jean Ave., Detroit 13, Mich. The unit may be obtained with or without a base, thus enabling the table which supports the checking heads to be used on a bench or elsewhere in the plant if desired.

Its accuracy is said to make the Red Ring Universal Gear Checker ideal for toolroom use and on final inspection, and its simplicity is claimed to make the unit equally desirable for service in the shop alongside gear cutting and finishing machines. Designed to handle gears up to 10 inches O.D., the unit is constructed to check lead, eccentricity, and both tooth spacing and tooth parallelism. It measures 18 inches wide x 29 inches long overall.

Micro
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LAY-OUT AND IDENTIFICATION DYE

12 COLORS*

For Tool, Die, Pattern or Template layout on metal . . . Quick identification of stock and parts . . . Shows up in sharp relief—dries instantly—easily removed . . . Write for circular.

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TAPPERS tap holes 2-56 to 2"

FRICTION OR POSITIVE DRIVE
Single adjustment changes from positive drive to light friction drive . . . prevents tap breakage.

No. 1 FRICTION OR POSITIVE DRIVE TAPPER drives 2-56 to $\frac{3}{8}$ " tap in steel or $\frac{1}{2}$ " in aluminum.

No. 2A POSITIVE TAPPER drives $\frac{3}{8}$ " to $\frac{7}{8}$ " tap in steel.

No. 3A POSITIVE DRIVE drives $\frac{1}{2}$ " to $1\frac{1}{4}$ " in steel, $\frac{1}{2}$ " to $\frac{3}{4}$ " pipe taps.

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All units efficient as production threaders using
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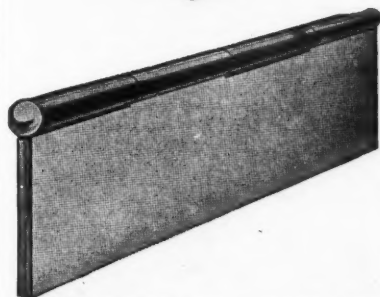
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Simply insert in holes, invert, strike sharply and you have centers and drill circles perfectly located. Reduce time and eliminate spoilage of other methods. 7 sizes U.S.S. Inexpensive — Last for years. Write for Circular.

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**"Cadet" Type 70FAS Heavy
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The Standard Electrical Tool Co., 2487 River Rd., Cincinnati 4, Ohio, announces the addition to its "Cadet" line of heavy duty grinders of a grinding machine with 7½ h.p. 1,150 r.p.m. motor for 20 x 3-inch grinding wheels.

Designated as the Type 70FAS, the machine is ball bearing equipped and includes guards that are made of structural plate steel and adjustable for wheel wear.

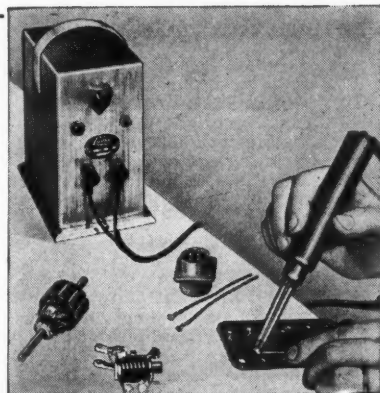


"Cadet" Type 70FAS Heavy Duty Grinder

Each guard has a hinged door, exhaust outlet, and adjustable spark breaker. A push-button safety starter having overload protection is conveniently located on the machine, optional equipment of which includes a removable water pot and safety glass eye shields.

**Magnus "Krazy-Dip" Cleaning
Machine**

Product of the Equipment Division, Magnus Chemical Co., Inc., Garwood, N. J., the Magnus "Krazy-Dip" Cleaning Machine shown herewith is designed for the washing of metal parts in automotive and aircraft shops, service stations, shipyard repair shops, railroad repair shops,



FOR FASTER, SAFER SOLDERING

The Luma resistance method of soldering is the accepted way for small shops requiring single operation to large plants with many types of operations. Write for complete information about this remarkable tool.

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NOW—NEW GLENNY BUSHINGS ADAPT STANDARD GLENNY BROACHES TO MANY NEW TIME AND MONEY SAVING OPERATIONS



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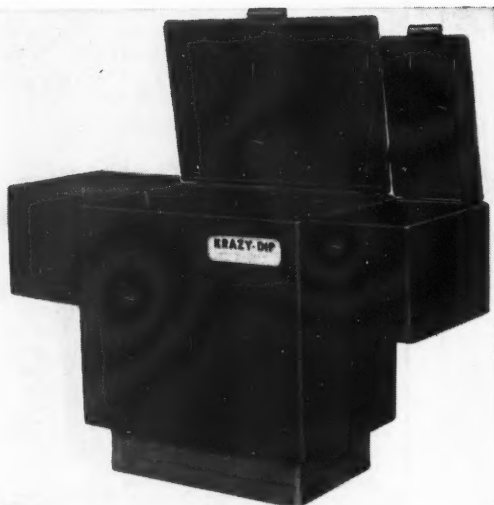
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Valves ★ Traps ★ Steam Specialties



Above, lever models; press. to 5000 lbs. Left, foot model; press. to 300 lbs. Also a full line of 3 and 4-way cylinder control valves; 1/8" to 1 1/2".



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Sturdily built of 14 gauge hot rolled steel sheet and with hinge cover complete with fusible safety link, the Krazy-Dip Cleaning Machine is designed for operation from an air compressor at an air consumption of 1 to 2 cubic feet per minute and a minimum air pressure of 50 p.s.i.

and metal-working plants. The machine is fully automatic in operation, the only manual labor required being that of loading and unloading the machine.

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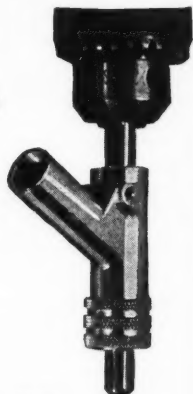
Reypo 15-Inch Drill Press

Manufactured by the Reypo Corp., 5751 W. 98th St., Los Angeles 45, Calif. the Reypo 15-Inch Drill Press shown

LOW COST LOCATING BY CENTER SCOPE

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Ample Adjustment
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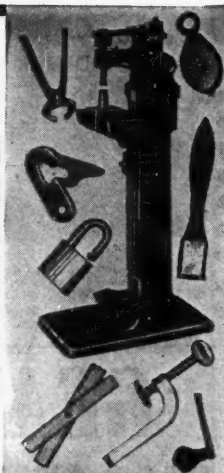
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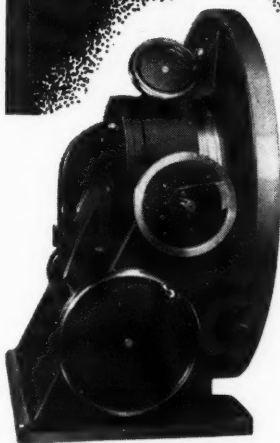
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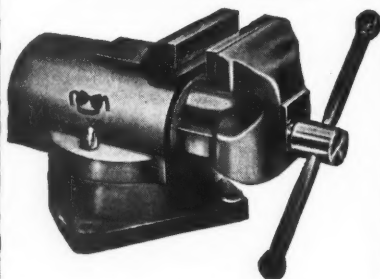
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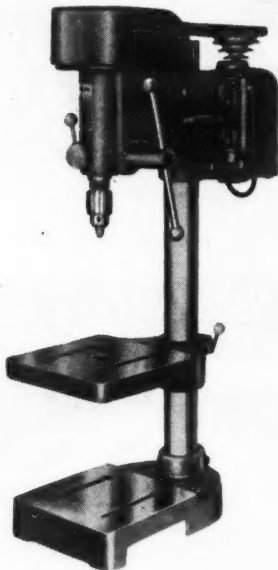
Write for further information.

VEIT & YOUNG

Established 1926
HUNTINGDON VALLEY, PA.

herewith features a depth stop which operates directly on the feed pinion between the two lower quill bearings, thus eliminating any side thrust or consequent deflection of the drill point, it is claimed. The quick setting gage of the press is calibrated in sixteenths of an inch.

The spindle has a travel of 4 inches, with four speeds from 630 to 4,850 r.p.m. The design of the free floating drive is said to prevent whip or misalignment and includes two sealed ball bearings for



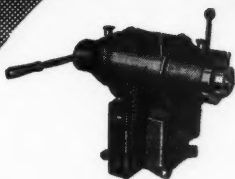
Reygo 15-Inch Drill Press

supporting purposes. The drive is effected through involute splines and mating involute keys. Two additional sealed ball bearings support the spindle.

Both the table and base of the drill press have ground working surfaces of 10 x 10 inches and are provided with parallel slots for ½-inch bolts. An additional feature of the machine is the provision of three quill bearings in the head.

Studebaker Hand-Operated Portable Hydraulic Press

A hand-operated portable hydraulic press for laboratory or production work is now being introduced by the Stude-



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Small Metal and Plastic Parts
Better, Speedier, at Low Cost

For the type and size designed
 to meet your particular needs

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The Schauer Machine Co.

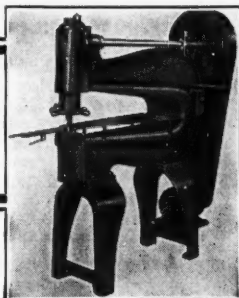
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 2060 Reading Rd. Cincinnati 2, Ohio

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W. J. SAVAGE COMPANY

Knoxville

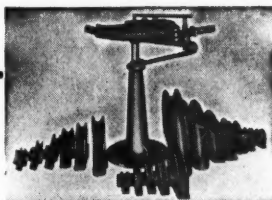
Since 1885

Tennessee

Pioneer Mfrs. of Nibbling Machines



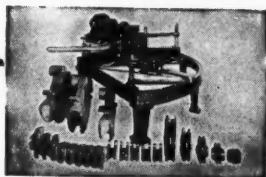
BY HAND or MOTOR
MACHINES TO BEND COLD PIPE, CONDUIT, BOILER TUBING
AND SOLID BAR . . . BENDING TABLES ALSO AVAILABLE



Above: Hand-powered Type A-30 . . . up to 180° bends
 . . . all sizes from $\frac{1}{2}$ " to 2". Only 7 parts. World's
 fastest, simplest machine. Note assortment of bending
 dies . . . this process makes shorter tangents than any
 other. Occupies only 18" x 18" floor space!

Other Sizes Available

Factory and Main Office: 14 Furnace St.,
 Poultney, Vermont



Above: Motor-powered Type E . . . bends fixed
 radii of 6 to 1 up to 90°. Type E bends 2½",
 3", 3½" and 4" pipe. 3 horse-power motor.
 Floor space occupied—7' 6" x 7' 6". Other
 power machines up to 8" capacity.

"American"
PIPE BENDING MACHINE
Company INC.

baker Machine Co., 1221 S. 9th Ave., Maywood, Ill. Optional with the unit are electrically heated platens for plastics or other operations that require temperatures. The heating element is thermostatically controlled for even distribution of heat over the entire platen.

Operation of a hand lever produces a pressure of up to 8 tons between the platens. The press can be efficiently adapted to broaching, assembling, piercing, oil grooving, riveting, sizing, forming, flanging, staking, forcing, and small die tryout operations. Special dies can be developed for any type of product requiring press work.

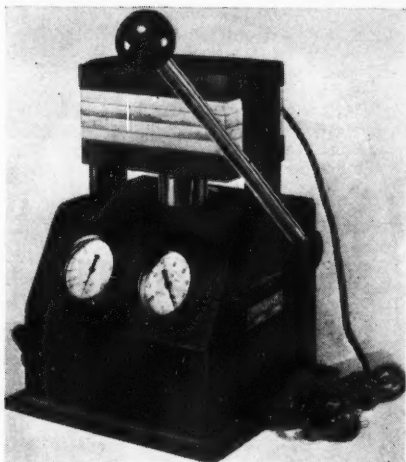
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Studebaker Hand-Operated Portable Hydraulic Press

The Studebaker Portable Hydraulic Press is self-contained and self-powered and is controlled entirely by a hand lever and release valve. Finished in baked enamel and durably constructed, the press has a 10 x 10-inch base, 13-inch height, 3-inch hydraulic ram travel, 5½ x 7-inch platens with openings (to suit user requirements) from 0 to 6 inches, and weight of 70 pounds.

Palmer-Shile Side Dump Trailer Truck

The Palmer-Shile Co., 16022 Fuller Ave., Detroit 27, Mich., is now manufacturing a side dump trailer truck in two styles for use in all types of industrial



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Standard Size Dowel Pins from ¼" to 1" diameter and from ¾" to 6" length supplied in .0002 and .001 over basic sizes. Unless otherwise specified, .0002 oversize will be furnished.

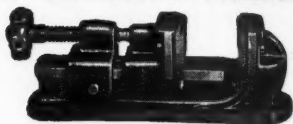
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DAVIS

KEYSEATER

will do the
job so much

quicker

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better?

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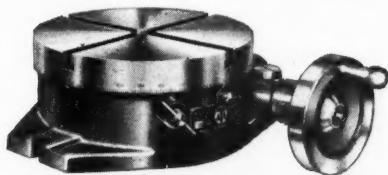


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9"	\$ 97.00
12"	175.00
15"	195.00
18"	235.00
18"	365.00 Extra Heavy Duty
21"	510.00 Extra Heavy Duty
25"	600.00 Extra Heavy Duty

OUR ROTARY TABLE WILL TAKE THE PLACE OF A COSTLY FIXTURE. IT IS USED FOR ALL KINDS OF WORK ON MILLING MACHINES, SHAPERS, DRILL PRESSES AND HORIZONTAL BORING MILLS.

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Dies. Plug & Ring
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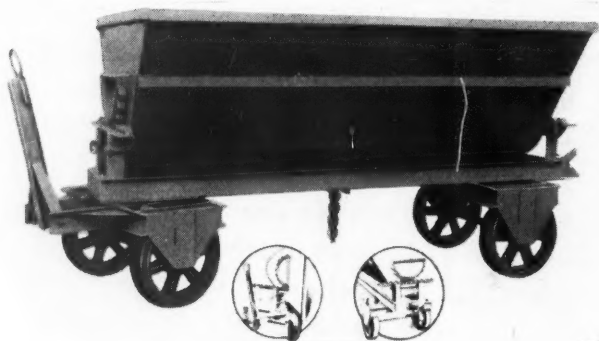
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200 Page
Catalog

LAFAYETTE TOOL & SUPPLY CO.

128 LAFAYETTE STREET

NEW YORK 13, N. Y.



Palmer-Shile Side Dump
Trailer Truck

unit features a heavy gauge reinforced steel body mounted on a substantial structural steel framework. The trailer includes a sturdy 30-inch long pull bar of all-welded construction and is equipped with four 18 x 3½-inch metal roller bearing wheels.

plants for such jobs as collecting, hauling, and dumping rubbish, scrap, gravel, metal shavings, borings, and similar loads. One style of the truck has gear type dumping rockers which are said to assure smooth action dumping, while the other style has an automatic coupler at the rear for train hauling.

With the Pamer-Shile Side Dump Trailer Truck, dumping is controlled to either the right or left side, whichever is desired. Especially engineered for trailing in train and for turning corners, the

Pannier "Master Marker" No. C-1055-A Universal Marking Machine

Welding rods, solder bars, short length tubing, and similar ferrous and non-ferrous products of ½ to 2 inches in diameter can be printed automatically with a motor-driven universal marking machine, designated as the "Master Marker No. C-1055-A," announced by The Pannier Corp., 202 Pannier Bldg., Pittsburgh 12,

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Standard slip and bracket type spindles are stocked for immediate delivery.

Made of alloy steel, heat treated and precision ground to an excellent finish.

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- Arms
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SPECIAL SPINDLES

Consult SEIBERT engineers before retooling or replacement.

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Interchangeable
type and holders
for every
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need



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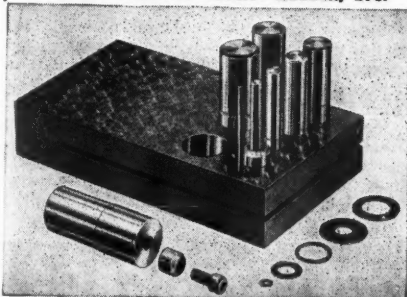
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Multiple Spindle Drilling and Tapping Machines • Automatic Drilling and Tapping Units • Multiple Spindle Attachable Drill Heads • Hot and Cold Swaging Machines • Hammering Machines • Tools, Jigs and Fixtures • Contract Work • Special Machinery.

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Up to 1/8" Thickness
IN STEEL—PLASTIC—MICA—RUBBER, ETC.



This handy shim and washer die set pierces the thinnest of shim stock or up to 1/16" through mild steel, without burring. Punch sizes are 3/16" to 1" in 1/16" or 1/8" graduations. 28 washer combinations. Made of high grade tool steel hardened and drawn to withstand shock without breakage. \$39.50 per set. Write for complete specifications. Finished Wooden Case \$4.75 extra.

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(A)



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Pat'd and
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Reg. U.S. Pat. Off.

SOCKET SCREW PRODUCTS

(A) The KNURLED Cup Point of this "Unbrako" Socket Set Screw—a point that locks, but does not burr—provides an excellent Self-Locking feature—a real "stay-put" Set Screw, if ever there was one . . . positively will not shake loose, regardless of the most chattering vibration! (B) The KNURLED head of this ubiquitous "Unbrako" Socket Head Cap Screw greatly helps to speed assembly. The KNURLS "gear" right to the fingers, no matter how oily, and a positive slip-proof grip is the result,—no waste motion. Of course, the Internal Wrenching feature provides cost savings in material, weight and space. Sizes available from No. 4 to 1 1/2" diameter, in a full range of lengths. "Unbrako" Screw Products acknowledge no superiors in strength.

Write for the name and address of your nearest "Unbrako" Industrial Distributor and your copy of the "Unbrako" Catalog.

Knurling of Socket
Screws originated with
"Unbrako" in 1934.

OVER 45 YEARS IN BUSINESS

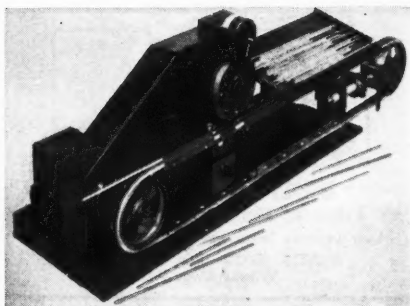
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JENKINTOWN, PA., Box 556

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Pa. According to the manufacturer, the machine is designed to handle uniform and irregular lengths of stock from 2 to 24 inches and is capable of printing continuously or intermittently as desired at a speed of 72 feet per minute.

Said to print in perfect register, thus correctly making bar recesses, the Master Marker No. C-1055-A is powered by a 1/4 h.p. motor and is equipped with a quick-change printing wheel, hopper feed, belt conveyor, automatic interior-feed ink fountain, and adjustments for wear. The printing wheel and conveyor are synchronized. A choice of dovetail rubber



Pannier "Master Marker" No. C-1055-A
Universal Marking Machine

wire dies, quick-set rubber dies, or interchangeable National rubber type is offered.

The Pannier Master Marker No. C-1055-A Universal Marking Machine weighs 220 lb. and is 44 inches long x 14 inches wide x 18 inches high.

**10
Models**

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**OFFSET
BORING HEADS**

3/8" to 1 1/2" bar capacity. 1/2"
to 12" diameter holes. Built-in
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High Speed

COUNTERBORES

BACK SPOT FACERS

Interchangeable

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BICKNELL-THOMAS COMPANY
Greenfield . Massachusetts



AAF Electro-PL Electronic Air Filter

Identified as the AAF Electro-PL, an electronic air filter with an intermediate cleaning efficiency has been developed by the American Air Filter Co., Inc., 215 Central Ave., Louisville 8, Ky. The filter is basically an electronic precipitator without an ionizing unit and contains a collector element of electrostatically charged Airmat paper. This paper is a laminated cellulose product composed of a number of plies of porous tissue-like sheets formed of short fibers in "jack-straw" arrangement and is also used as a filtering media in mechanical filters. When an electrostatic charge is applied

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PROMPT DELIVERY

UP TO 12" DIAM. - 3 D. P.

CUTTING ONLY or COMPLETE GEARS

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**NO
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1. Ideal for tool room & maintenance shop
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4. Mandrel capacity to 1 1/2"
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4 SIZES
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Machine Tool Accessories

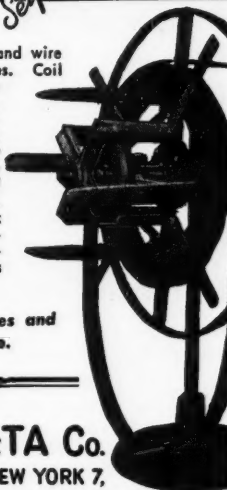
53 PARK PLACE

N. Y. C. 7, N. Y.

WESTLEN REELS

*Adjustable
Self Centering*

For feeding strip and wire coil stock to presses. Coil capacity 300 to 500 lbs. Outside ring dia., 28" to 36". Height of reel, 36". Wheel automatically adjusts parts to suit inside diameter of coils from 11" to 20". Arm allows for quick conversion to horizontal or vertical position and adjusts height of reel.



Write for prices and literature.

The RULETA Co.

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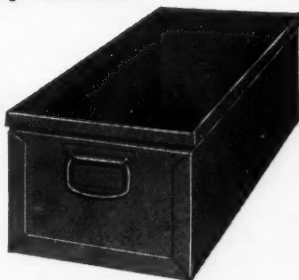
Top Rim STEEL STACKING BOXES

18" x 12" x 6". 16 Ga.
with Drop Handles

STANDARD SIZES

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- 18 x 12 x 6.....16 Ga.
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MADE IN OTHER SIZES



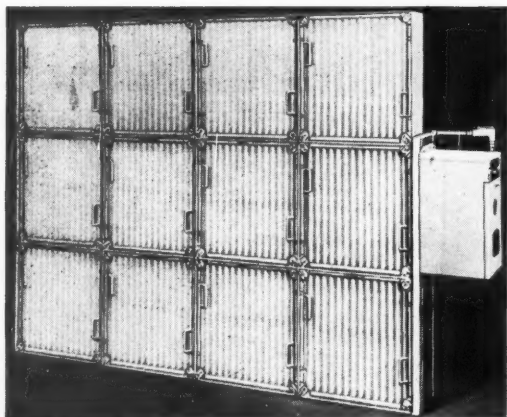
WE MANUFACTURE ALL TYPES OF STEEL BOXES

We make a specialty of boxes made to fit your particular handling requirements. Special boxes designed so they can be run thru with standards enable us to quote prices comparable with that of a standard box.

STERLING

FACTORY EQUIPMENT CO.

183 CHARLES ST.
PROVIDENCE, R. I.



**AAF Electro-PL Electronic Air Filter
(Straight Bank Arrangement Size)**

months when a smoky atmosphere is prevalent and as a dry-type air filter during the summer months. Maintenance is said to be simplified since the Airmat paper is replaceable with new material when it has accumulated its full dust load.

Merz New-Tronic Gages and Ball Sorting Machine

The Merz Engineering Co., Indianapolis, Ind., has acquired exclusive patent, manufacturing, and sales rights to the Jack & Heintz electronic inspection equipment, which will now be marketed under the designation of Merz New-Tronic. Three types of New-Tronic equipment are available; namely, comparator, height gage, and ball sorting machine.

The Merz New-Tronic Comparator is intended for external measurements and

to the paper, the plies tend to separate and each individual fiber becomes a collecting electrode which attracts and holds dust and smoke particles.

Since the Electro-PL is said to continue to function as an efficient air filter when de-energized, its operation may be varied to suit the dust conditions—as an electronic air cleaner during the winter

PRENTISS



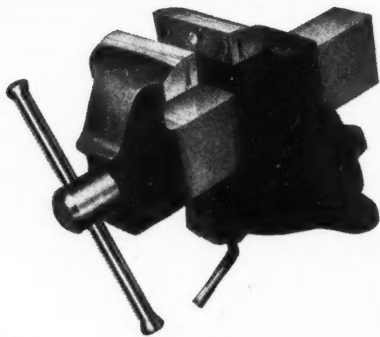
TOOL ROOM VISES

To hold irregular pieces. With taper pin removed, back jaw swivels as vise is screwed up on work. With Taper pin inserted, it becomes a regular vise.

*Your Industrial Distributor
can furnish.*

PRENTISS VISE DIVISION
OF THE CHARLES PARKER CO.

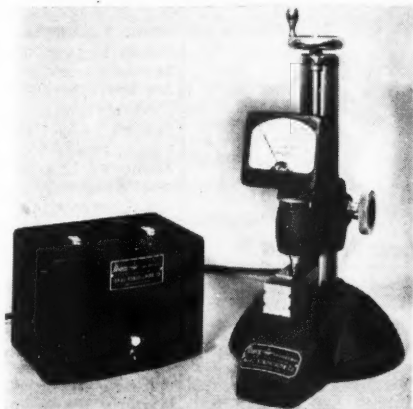
Top Swivel Jaw Service That Satisfies



MERIDEN, CONN., U. S. A.

is available in four models with fixed or adjustable work-contact pressure. All models are equipped with two magnification scales. The "A" scale provides a range of plus or minus 3/10,000ths in graduations of ten-millionths. The "B" scale has a range of plus or minus 3/1,000ths, calibrated in one ten-thousandths. All models have identical methods of operation.

The Merz New Tronic Height Gage is furnished complete with a stand that is equipped with fine adjustment for speed and convenience in operation as a height gage, a comparator, for checking concentricity or setups on machine tools, and so on. As an added feature, the gag-



Merz New-Tronic Comparator

ing head mounting is provided with a standard A.G.D. lug, thus making the unit readily adaptable for use with existing fixtures. The unit has the same range and scale calibrations as the Merz New-Tronic Comparator.

The Merz New-Tronic Ball Sorting Machine is available in two standard models. The Model A is designed to handle balls ranging from $\frac{1}{8}$ to $\frac{1}{2}$ inch in graduations of $\frac{1}{16}$ inch, making ten selections to an accuracy of 10, 20, or 50 millionths of an inch at a rate of 3,600 balls an hour, it is claimed. The Model B is designed to handle balls in graduations of $\frac{1}{8}$ inch within the range of $\frac{1}{8}$ to $\frac{1}{2}$ inch, sorting them to accuracies of 20, 50, or 100 millionths of an inch, it is stated. Both models are fully automatic. To handle balls of other sizes within the $\frac{1}{8}$ to $\frac{1}{2}$ -inch range, special shims can be furnished for any increment.



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Why?

Because that Red Coat comes from a special process which covers each grain with a new tough sharp surface—

A surface which enables you to see the difference and tell the difference.

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BELTS, ROLLS AND SHEETS

Michigan Abrasives are supplied in Belts, Discs, Rolls, Sheets—paper or cloth backed—in Silicon Carbide, Aluminum Oxide, Garnet—in full range of standard grit sizes.

MICHIGAN ABRASIVE CO.

1111 BELLEVUE AVE. • DETROIT 7, MICH.

Michigan
**COATED
ABRASIVES**

Hilco Steel Shelving

A line of steel shelving comprising both open and closed type shelving units is now being offered by the Hilco Manufacturing Co., 1721 Elston Ave., Chicago 22, Ill. The units are available in shelf sizes of 8 x 24, 8 x 30, 8 x 36, 12 x 24, 12 x 30, 12 x 36, 18 x 36, and 24 x 36 inches, and include high carbon angle uprights 1 x 1 x 1/2 inch in lengths from 37 1/2 inches to 10 feet 1 1/2 inches. Holes are punched on 1 1/2-inch centers.

The Hilco Steel Shelving Units have a standard olive green color, with other


colors available on order, and are designed to support loads from 100 to 150 lb. per shelf. Card and ticket holder strips in lengths from 6 to 30 inches are available for labeling articles on shelves. Special shelving units can be made to order.

Supersonic Reflectoscope Type SR05

Production of the Supersonic Reflectoscope Type SR05 is announced by Sperry Products, Inc., 1505 Willow Ave., Hobo-

ken, N. J. Intended for the non-destructive testing of metals and other materials for internal defects, as well as for testing welds, the instrument includes specifications matching those of the model presently in use; however, radical changes have been made in the size, appearance, and operation of the instrument.

According to the manufacturer, elimination of waste air space and a complete redesign of circuits are responsible for the increased weight and bulk of the Type SR05 Reflectoscope. The Type SR05 is approximately 14 x 16 x 23 inches in size and can be carried by means of handles on the case, thus eliminating the wheeled carriage which supported the older instrument. The overall weight of the Type SR05 is approximately 85 lb. or about half the previous weight.



Here's a worth-while investment.

Impregnated with carefully selected diamond grains of uniform size, insuring perfect finish with maximum efficiency, "Secomet" Diamond Wheels remove in the same time and at greatly reduced cost, five to six times the amount of carbides or hard metal that could be removed with a silicon carbide wheel.

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This Modern Wheel Dresser operates on a resilient bushing. It offers lower initial cost, sharper tools and a smooth shock-proof dressing action. Write for complete details.

You should have one by each grinder.

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High Speed Cutting Tools

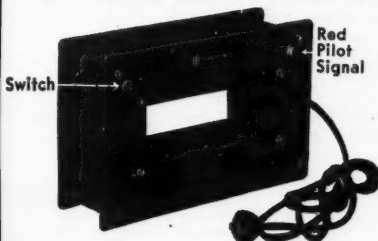
• Special high speed circular, dovetail, flat form and special tool bits. • Design and manufacture of small machines, jigs, gages and experimental parts. • Regrinding and salvaging high speed flat form, special bits and small flat broaches.

Write for quotes.

Attractive Proposition for Representatives

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AMC Quick DEMAGNETIZER



A necessity where machine tools are used.

Standard units available and special sizes to order.

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Variable Speed Motors



Flexible Shaft Units



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New! It's the GOVERNOR CONTROL Speed-Right Flexible Shaft

CHECK THESE IMPORTANT EXCLUSIVE FEATURES

- ✓ Variable Governor Control Motor delivers constant desired speed under heavy load or while idling.
- ✓ Sturdy Heavy Duty Ball-Bearing Motor powers the flexible shaft at any speed required from 1000 rpm to 10,000 rpm.
- ✓ Instant-set Smooth Efficient Power for stock removal and polishing of all materials hard or soft.
- ✓ Handpieces For All Types of Work
 - Ball-Bearing • Chuck • Small Pencil • Collet • Reciprocal Filing • Hammer Peening.

Write for Bulletin 306

DO IT RIGHT WITH

Speed-Right THE ELECTRO-MECHANO CO.

261 EAST ERIE STREET
Milwaukee 2, Wisconsin



The sensitivity of the instrument is said to remain the same, however, the operation has been considerably simplified by reducing the number of external controls to five. With these controls, the operator can vary sensitivity, pulse width, sweep length, screen markers, and frequency. Visual indication of internal defects remains unchanged on the oscilloscope screen, but the tube is a smaller, 5-inch high-intensity type.

The Supersonic Reflectoscope Type SR05 is claimed to not only facilitate the testing of manufactured products from



Supersonic Reflectoscope Type SR05 in Use

raw material to finished stage, but the increased portability inherent in the new design makes it particularly adaptable for the field testing of welds in tanks, pipe, and various structures, and for locating fatigue cracks in assembled plant equipment.

Vi-Speed
AIR-POWERED

**FAST
RUGGED**

- HOLDING
- PRESSING
- PUNCHING
- SIMPLE
• DESIGN
- 8 MODELS
- Guaranteed
- WRITE FOR
• CATALOG

VAN PRODUCTS CO.
139 G. D. BALDWIN BLDG.
ERIE, PENNA.

**AUTOMATIC
CHUCKING AND INDEXING
FIXTURE**

- 1.—1800 light cuts per hour.
- 2.—Either horizontal or vertical position.
- 3.—Collets changed instantly.
- 4.—Automatically knocks piece out.

Model D—Ratchet indexing only—1" cap.
Model E—Both degree and ratchet indexing
—Capacity up to 1"
Model F—Both degree and ratchet indexing
—Capacity up to 2 1/4"

Write for Folders

J. W. DEARBORN • Ansonia, Conn.

Porter-Cable Improved Model FT-9 Automatic Feed Table

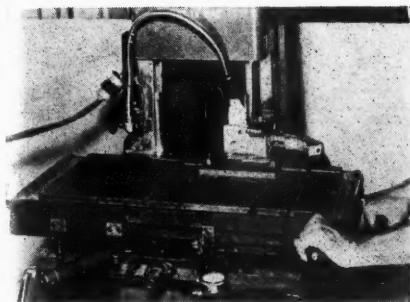
An improved automatic feed table, designated as the Model FT-9, is now available for the Porter-Cable Model BG-8 wet abrasive belt grinder. According to the manufacturer, Porter-Cable Machine Co., Syracuse 8, N. Y., the redesigned table provides for greater precision and a smoother approach for feeding work into the grit belt than heretofore. With the table, practically any material may be ground and polished to a close tolerance.

Earlier models of the FT-9 table used the same oil-coolant in the recirculating

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Fast, Accurate
Metal-Cutting
Use*

KENNAMETAL CEMENTED
CARBIDE
TOOLS, BLANKS, and MILLING CUTTERS

KENNAMETAL Inc.
LATROBE, PA.



Porter-Cable Improved Model FT-9 Automatic Feed Table in Use

system of a hydraulic liquid for the feed table. Two separate systems have now been installed. Special coolants may be used for various materials, while the table is independently operated by a standard hydraulic oil. In addition, a rod has been added to the former free piston, with a gland at the end of the cylinder oil shield to assure a smooth, positive action at all times.

The FT-9 table is designed to automat-

ically control the pressure and rate of feed, while a dial indicator shows the rate of machining. A micrometer stop halts the operation, the stop being arranged for instant resetting. Additional manual controls permit a wide variety of applications. The design of the table includes T-slots for holding fixtures.

Erwood V-425 Milling Machine and Drill Press Vise

Designated as the V-425, a swivel base milling machine and drill press vise which is said to fill the need for an accurately made vise to meet the exacting requirements of toolroom, model, and machine shops is now being marketed by The Erwood Co., 214 Woodstock St., Crystal Lake, Illinois.

Rigidly constructed to reduce chatter and assure long cutter life, the vise includes a base and body cast from semi-steel; all surfaces not machined are provided with a baked wrinkle finish. The swivel base is calibrated for 90-0-90 deg. (180-deg.) rotation and is provided with four slots for use in properly fastening the vise to the machine. The vise has a jaw width of 4 inches and is equipped

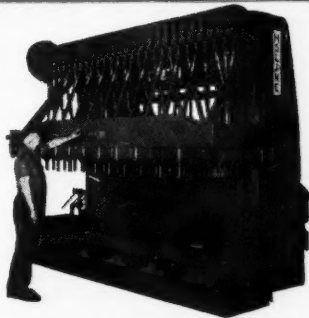


- ★ At greater Man-Hour SAVINGS
- ★ At higher rated EFFICIENCY
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A Moline Multiple, Spindle Specially Designed Machine Tool can do your job better at less cost. Ruggedly built to fit your INDIVIDUAL requirements in such operations as Boring—Straight Line Drilling—Universal Adjustable Spindle Drilling—Honing—Tapping—Reaming—Counterboring—Special Milling—these machines are based on years of experience accumulated since 1901.

For your SPECIAL problem go "Hole-Hog" and write us for any information you may need.

No. HU68 DRILLER



MOLINE TOOL COMPANY
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SCHERR aids to precision — production

SCHERR MICROMETERS have vernier reading to 1/10,000



at no extra cost,
in 1", 2", and 3"
sizes. This is right
in step with mod-

ern demands for higher accuracy.
Available in sizes up to 96". All
Scherr micrometers have solid forged
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thimble and vernier; longer life and
more sensitive touch due to a burn-

ishing process which compresses and polishes the
surface of the thread; such refinements as ratchet stop
to control the measuring pressure, and decimal equivalent
markings on frame or barrel. Prices, 1", as shown,
\$11. 2" (black frame), \$9.50. 3", \$10.25. Write for
bulletin and order the micrometers you need now.

Measure depth easily with these DEPTH MICROMETERS

Made with 2½" and 4" base.
Each instrument furnished
with three interchangeable
rods, to measure depth to
1", 2", or 3". With or with-
out ratchet. A handy tool that
can save its cost in a single
precision job. Price, with
ratchet, 2½", \$10. 4", \$11.25.



An invaluable inspection tool —



THE SCHERR MAGNI-RAY

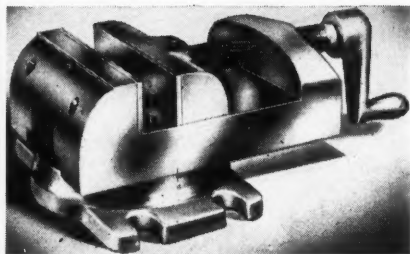
Magnifies the work
under inspection,
floodlights it as well, and gives the
immense advantage of "two-eye see-
ing." No wonder thousands of Mag-
ni-Rays are serving in large inspec-
tion departments, and other thou-
sands on precision machines or critical
toolroom operations. The lens is
ground by experts for true magnifica-

tion. Heavy base permits swinging lens to any position,
any height to 14 in. Three types—Model A, 3"
lens, 1½x plus, \$21.65. Model B, 3x plus, \$29.
Model C, 5" lens, 1½x plus, \$34.

Write for full details on these tools, and
for the Scherr Small Tool Catalog.

GEO. SCHERR CO., Inc.

198-A Lafayette St. New York 12, N. Y.



Erwood V-425 Milling Machine and Drill Press
Vise

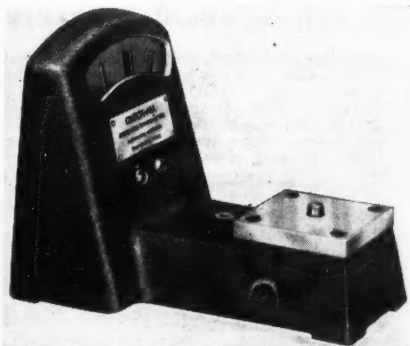
with jaws having hardened steel plates
which are replaceable. The maximum
jaw opening is 2½ inches and the jaw
depth is 1 inch. The clamping screw is
made of heat-treated steel and is provid-
ed with a semi-steel handle.

If desired, the Erwood V-425 Milling
Machine and Drill Press Vise can be fur-
nished without a swivel base.

"Check-All" Gage

Known as the "Check-All," a simple
comparator gage that is designed to han-
dle a wide variety of work is now being
marketed by Roper & Broderick, Inc.,
1694 Main St., Springfield, Mass. By
changing the plate and pin and setting
with masters, the gage can be used to
check many dimensions on the same parts
or different parts. According to the manu-
facturer, the gage provides a multiplica-
tion of approximately 200 to 1 and will
check up to plus or minus 0.010-inch tol-
erance. A standard hardened steel drill

"Check-All" Gage



Lyon-Raymond Power Operated Hydraulic Pump

bushing is used to guide the gage pin, which is replaceable in case of wear.

The Check-All Gage can be used in gaging depth of counterbores, valve seats, length of shoulders, depth of a counterbore with center of part, hole location, concentricity of hole with O.D., depth of drilled holes, depth of centers, concentricity between two outside diameters, shoulders, undercuts, diameter of undercut, and so on.

Lyon-Raymond Power Operated Hydraulic Pump

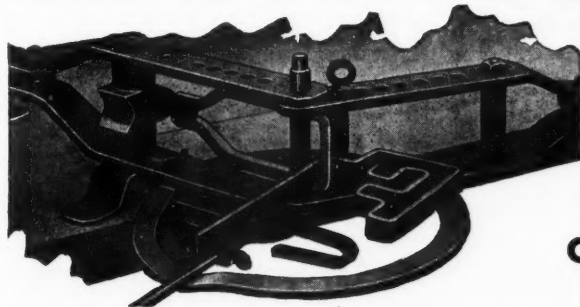
The Lyon-Raymond Corp., 5866 Madison St., Greene, N. Y., has designed a package type hydraulic power unit that is said to deliver $1\frac{1}{2}$ gallons of oil per minute and develop a pressure of 1,000 p.s.i. Compactness is obtained by the use



of a flange mounted motor which is placed directly on top of the oil reservoir. Although the reservoir has an oil capacity of $2\frac{1}{2}$ gallons, the entire pump assembly is only $18\frac{1}{4}$ inches high x $12\frac{1}{2}$ inches in diameter.

The unit is furnished with all controls and is ready for operation as soon as the pressure line is connected and the electric cable is plugged into a standard outlet. Since all controls are electric, the pump can be operated from remote positions if desired. A $\frac{3}{4}$ h.p. a.c. motor is

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in
U. S. and Canada

**Bending
Ornamental
Iron Work**

Write for Details

Hossfeld Manufacturing Company

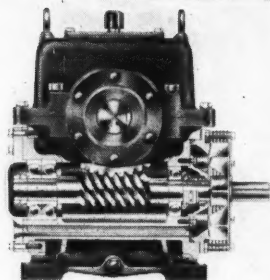
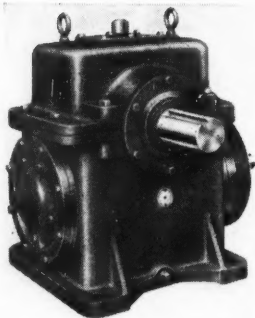
452 West Third Street

Winona, Minnesota

**Foote Bros. Horizontal Type
"Hypower" Enclosed Worm
Gear Drive**

used, the motor being available for 110, 220, or 440-volt service. The valves utilize an "open center" arrangement which permits the motor to idle except when the unit is pumping oil to the pressure line. Two controls are regularly furnished—a main starting switch and a push-button operating switch. A foot control switch is optional. An adjustable relief valve and the electric control valves are built into the base of the unit so that they are accessible by tilting the assembly slightly.

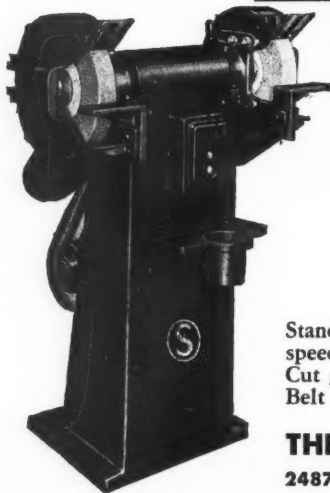
The standard unit is furnished with a 3-way valve for operating a single-action hydraulic cylinder. Four-way valves for operating double-action cylinders are available. Various combinations of motors, pumps, and controls can be furnished, as well as various styles of hydraulic cylinders, to provide for a wide variety of possible uses.



**Foote Bros. "Hypower" Enclosed
Worm Gear Drive**

Foote Bros. Gear and Machine Corp., 4545S. Western Ave., Chicago 9, Ill., announces the introduction of an enclosed worm gear drive known as the "Hypower." Outstanding features claimed for the drive include unusual load-carrying capacity accomplished by means of a new technique in generating gears; high thermal capacity due to the immersion in the oil reservoir of an air channel cylinder through which passes a high velocity

NOW... TRIPLE SAVINGS



IN YOUR GRINDING ROOM

**HERE'S HOW WITH THE
STANDARD BDG:**

- 1—Wheel costs are lowered!**
- 2—Time is saved!**
- 3—Production is increased!**

Standard's belt driven grinders reflect correct peripheral speeds on wheels at all times down to wheel flanges. Cut grinding room costs today! Write for catalog 44. Belt driven grinders from 1 H.P. to 60 H.P.

THE STANDARD ELECTRICAL TOOL CO.

2487 RIVER ROAD

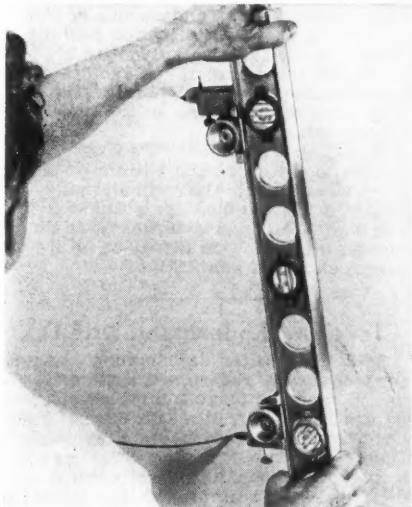
CINCINNATI 4, OHIO

stream of cool air; elimination of oil leakage by the use of a carbon lapped ring type seal; small size and lightweight.

The Foote Bros. Hypower Worm Gear Drive is available in horizontal and vertical types in a wide range of standard ratios to meet practically any need. The unit complies with A. G. M. A. and N. E. M. A. speed-ratio standards.

Trammel Points for Schultes Levels

Said to be particularly useful in laying out circles, spacing holes around a circle, and spacing two-by-fours or joists,



Schultes Level Equipped with Trammel Points

trammel points which may be readily attached to Schultes levels are now being offered by Schultes Level, Inc., 17403 Gable Ave., Detroit 12, Mich. The points are also claimed to be of particular use to draftsmen as a substitute for a beam compass in making larger type drawings.

One of the points includes a mechanism for fine adjustment. Both points are made of aluminum.

Knu-Vise Model P&P-800 Clamp

Designated as the Knu-Vise Model P&P-800, a push-and-pull type clamp intended for use in places where space is

TAPPING TIPS

From Woody Spencer's Notebook



HEAVY FEET AND HEAVY HANDS GET US ALL IN TROUBLE . . .

Drivin' along with the missus the other Sunday afternoon, I was kinda dreamin' I guess an' my wife says, "Woody, ain't your foot sorta heavy? How often have I heard you tellin' the boys on the tappin' machines; 'don't bear down so hard'." She had me there. Don't s'pose any one thing causes more trouble, oversize an' bell mouth holes than too much pressure startin' the tap. Jes' let the tap go—it'll find its own lead. Then it'll thread true an' you'll get pretty, well tapped holes every time.

LET ME ALONE



The individual problem that comes up with almost every tapping job requires a specific engineering solution. So, if you will send us complete information on the job (material, depth, pitch and diameter, lubricant, etc.) our engineers will be glad to make recommendations without obligation.

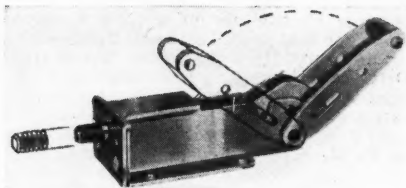
Note—Woody Spencer's Tapping Tips will appear here as regularly as "Woody" gets time to write them up. Look for them.

THE RIGHT TAP AT THE RIGHT TIME

The Wood & Spencer Company
Cleveland 3, Ohio

limited or under circumstances where the operating handle cannot be accommodated except at some distance from the point of pressure application is announced by the Lapeer Mfg. Co., 3056 Davison Rd., Lapeer, Mich. The clamp is also said to be useful where the plunger must travel under load either pushing or pulling rather than creating pressure merely at the end of the stroke.

According to the manufacturer, the Knu-Vise Model P&P-800 Clamp is designed to exert up to 800 lb. pressure with normal hand operation in either the push or the pull movement of the handle, the



Knu-Vise Model P&P-800 Clamp

clamp being automatically locked and the work held firmly upon completion of the handle swing. The unit, with the plunger at either extreme, can be used for holding parts on a milling machine, drilling machine, cut-off saw, and so on, or it can be used to exert a continuous pushing or pulling motion during the entire 1 1/4-inch travel of the plunger. To facilitate the performance of such operations, auxiliary holes are provided in the handle for extensions.

The Knu-Vise Model P&P-800 Clamp can be mounted on the bottom or on the front at any angle that will allow for free swing of the handle. The plunger is provided with both an external 3/8-24 thread and an internal 1/4-28 thread to afford the user a choice of adaptation.

Cleveland Redesigned Drill Drift

Said to be safer and handier than its predecessor, a redesigned drill drift for use in shops employing taper shank tools is announced by the Cleveland Twist Drill Co., 1242 E. 49th St., Cleveland 14, Ohio.

According to the manufacturer, the drift has been improved by adding a shoulder or flange on the head end of the tool, which is not only less damaging to babbitt hammers but permits a more direct, solid driving force to be applied to

STEEL ADJUSTABLE COMPARTMENT SHELF DRAWERS



Style 90 BCH

Immediate Shipment

Ideal for handling and storing small quantities of small parts. Boxes slotted on 1" centers to accommodate dividers. Label holder on front for easy identification of contents. Pull handles on front only. Drawers finished in baked green. Dividers furnished at slight extra cost.

Other Sizes and Styles Available

91 BCH	5 1/2 x 11 1/4 x 2 1/8	Green Finish	92c ea.
92 BCH	5 1/2 x 17 1/4 x 2 1/8	Green Finish	1.06 ea.
93 BCH	8 1/4 x 11 1/4 x 2 1/8	Green Finish	99c ea.
94 BCH	8 1/4 x 17 1/4 x 2 1/8	Green Finish	1.18 ea.

Send for Catalog

All Prices F.O.B. Philadelphia Plant
Phone — Wire — Write

Telephone Baldwin 9-1805

BAY INC. 3015 North 16th St.
PHILADELPHIA 32, PA.

SOMETHING NEW . . .

TRUE CENTERS TRANSFERRED Instantly WITH UNIVERSAL TRANSFER PUNCH

No Layout, Measuring or Scribing required—Automatically centers and squares itself with finger tip pressure.

(3 Sizes: 1/8 x 1/2", 3/16 x 3/4" and 1/4 x 1")

Tool Specialty Salesmen Wanted

Universal Transfer Punch, Inc.

Dept. M, Box 412,

Massillon, Ohio





Cleveland Redesigned Drill Drift

the enlarged end and also retards mushrooming due to the added metal at the head. In addition the enlarged end is said to prevent the drift from flying through the spindle slot, and the ears provided permit the drift to be easily picked up. The drift is provided with a hole so that it may be chained to a machine or hung on a wall.

Edgemont V-Belt Pulley Clutch

Unusually quick release, minimum wear on V-belts, smooth starting, easy take-up for wear, and unusual compactness are features claimed for a clutch with integral V-belt pulley announced by The Edgemont Machine Co., 2137 Home Ave., Dayton 1, Ohio. Intended for application in motor powered mowers, lawn sweepers, road markers, cultivators, small portable conveyors, and special machinery using V-belt or chain drives, the clutch is furnished in ratings of $\frac{1}{4}$ and $\frac{1}{2}$ h.p. at 100 r.p.m. and in shaft sizes from $\frac{3}{4}$ to 1 $\frac{1}{4}$ inches. The unit is available from stock with a V-belt pulley having one V-groove of 3 $\frac{1}{2}$, 4 $\frac{1}{4}$, or 5-inch P.D. or two V-grooves of 4 $\frac{1}{4}$ or 5-inch P.D. Special V-belt pul-

leys or adapters for mounting sprockets or gears can be readily obtained.

When the clutch is disengaged, the pulley operates freely on its shaft. To engage the clutch, a steel cam, induction hardened, moves two drop forged levers which, in turn, move a friction plate axially against the liner, thus engaging the pulley, which is restrained from axial movement by an adjusting collar. A snap ring on the adjusting collar engages with notches on the rim of a steel washer keyed to the clutch body, and thus take-up for wear is effected by a positive "indexed" adjustment.



GUN TYPE SAW

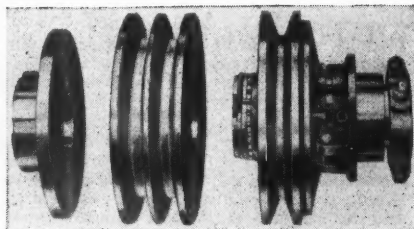
At last, a saw which cuts anything, stainless steel, rubber, wood, aluminum, etc. Blade has a variable speed which is set in 45 seconds . . . the stroke length of the blade is adjustable depending on thickness of materials. Transa has

twice the power on the cutting stroke due to a special gearing arrangement. Special guides for each width of saw blade eliminate whipping, turning or cracking the blade, and acts as a cutting guide at the same time. Transa guns are used extensively in machine shops, assembly plants, fabricating industries, repair and shipping departments.

Write for free bulletin.

TRANSA INC.

440-45 Gateway Bldg.
Minneapolis, Minnesota



(Right) Edgemont Clutch with Single V-Belt Pulley (Left) Adapter Plate and Double Pulley Which Can Also Be Assembled with the Clutch

When the cam is moved to disengage the clutch, centrifugal force on the levers tends to remove the force on the friction plate, thereby making release fast and positive, it is claimed. Self-lubricating bushings are used in both the pulleys and adapters.

New Cartons for Airco Products

The Air Reduction Sales Co., 60 E. 42nd St., New York 17, N. Y., has announced the adoption of a colorful new

set of boxes and cartons for the packaging of Airco welding torches, tips, cutting attachments, regulators, and other products. The purpose of the orange and black containers is to afford maximum protection to the products, provide for more efficient stock control, permit quick inventory taking, and facilitate handling.

Each product is packaged in an individual box, clearly marked by product name and stock number. This information appears on one end of the box so as to permit easy identification.

Howald Replaceable Blade Carbide End Mill

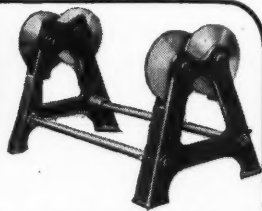
The W. T. Howald Machine Works, 182 Sigourney St., Brooklyn 31, N. Y., announces the addition of a carbide end mill with replaceable blades to its line of carbide end, face, and shell milling cutters. Especially designed for production milling, the end mill is available in diameters of 1½, 2, and 3 inches and has, as an integral part, a No. 40 N.M.T.B., Weldon or Brown and Sharpe No. 9 shank.

The replaceable carbide-tipped blades are made of standard square stock without serrations, grooves, and so on. The

SELECT THE BEST ...

Balancing Tool for Your Work from Sundstrand's Complete Line

Here's a complete line of Balancing Tools which will save their cost quickly on balancing or truing operations. Accurately sensitive and durable, they provide a simple, reliable means for checking the balance of parts like gears, shafts, fly wheels, pulleys, etc. The standard sizes available are shown in capacity chart at right.



CAPACITIES

Swing	Between Standards	Weight Capacity
21 in.	20 in.	12 lbs.
21 in.	20 in.	800 lbs.
43 in.	29 in.	800 lbs.
43 in.	29 in.	2,000 lbs.
6 ft.	5 ft.	5,000 lbs.
8 ft.	8 ft.	10,000 lbs.
Any	Any	24,000 lbs.
43 in.	30 in.	800 lbs.

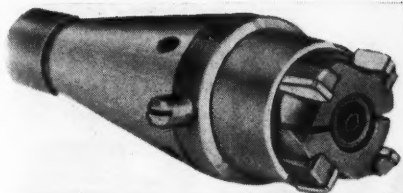


FREE ADDITIONAL DATA

You can obtain complete information on Sundstrand Balancing Tools by writing for bulletin No. 577.



SUNDSTRAND
MACHINE TOOL COMPANY
2539 Eleventh St. Rockford, Ill., U.S.A.



Howald Replaceable Blade Carbide End Mill

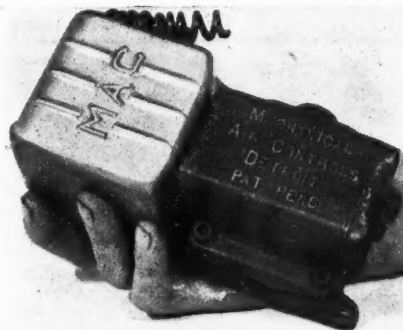
unique "cone blade lock" feature of the tool permits rapid adjustment of the blades to within a few thousandths of an inch, thereby minimizing cutter grinding and also reducing set-up time to a minimum.

"Mac" Four-Way Solenoid Air Valve

A four-way solenoid air valve for the control of double-acting cylinders is now being marketed under the trade name of "Mac" by Mechanical Air Controls, Inc., 3049 E. Grand Blvd., Detroit 2, Mich. According to the manufacturer, the design incorporates the ease of operation of the balanced type valve and the "seal with air pressure" feature of the poppet type valve.

Simple in construction, the Mac Four-Way Solenoid Air Valve has one moving or wearing component consisting of two small "O" rings assembled on an alloy piston. The "O" rings are said to provide positive seals in conjunction with hard chrome seats which are integral with the bronze body. Claimed to eliminate the

"Mac" Four-Way Solenoid Air Valve



TODAY'S METAL CUTTING REQUIRES GOOD CUTTING FLUID



says...
"CHIP" WRIGHT

Material shortages and other unusual postwar conditions emphasize the need for sound cutting fluid practices. Uncontrollable changes in material quality call for cutting fluids with wide latitudes and broad tolerances. In such cases, the smart thing is to call on the broad, practical experience of established cutting oil people. They have the technical knowledge and facilities to apply their "know how" to your job.

Chip

An Economical Solution

SUPERKOOL Base Cutting Oil

Available already correctly mixed, Super-Kool eliminates on-the-job mixing... makes possible worthwhile economies in time, labor and money. For recommendations of SuperKool mixes, consult a Stuart service engineer.



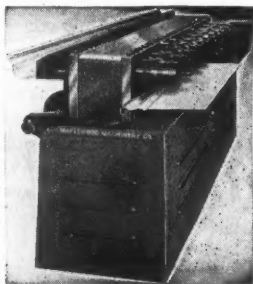
D.A. Stuart Oil Co.
EST. 1885 LIMITED

2741 1/2 South Troy St., Chicago 23, Illinois

need for gland packing, the alloy piston and "O" ring component can be quickly replaced by simply removing four cap screws.

Although very small and compact, the Mac Air Valve, due to its full $\frac{3}{8}$ -inch orifice together with a straight-through flow feature, is said to minimize pressure drop through the unit. Restriction of exhaust is claimed to have no effect on the operation of the valve, which features direct solenoid control utilizing 2.4 amperes at 220 volts to assure immediate and fast operation for any air application.

Roll Forming Machines and Roller Dies



Also Pittsburgh Lock Machines, Pipe and Elbow, Beading, Turning Machines and all other Sheet Metal Working Machinery—

Your inquiries invited.

Maplewood Machinery Co.

2636 Fullerton Ave., Chicago, Illinois

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ABRASIVE BELT SURFACER

Speed and quality in grinding flat surfaces of metal, wood, hard rubber, celluloid and plastics. Obtainable in both vertical and horizontal types—9", 14", 20" sizes.

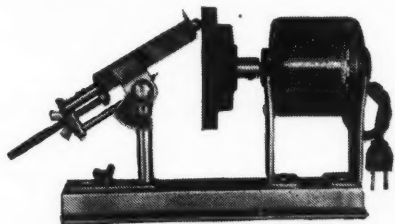
SEND FOR ILLUSTRATED PAMPHLET.

Production

MACHINE COMPANY GREENFIELD, MASSACHUSETTS, U.S.A.

E Z Drill Grinder

A drill grinder which is said to provide for the sharpening of the average drill to exacting industrial standards in 30



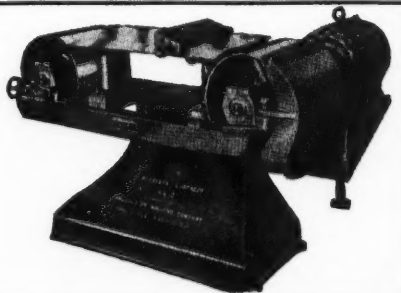
E Z Drill Grinder

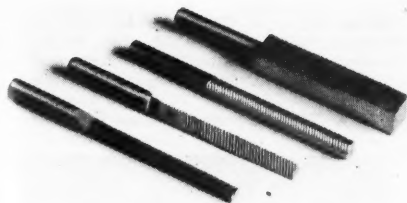
seconds is announced by the E Z Manufacturing Co., 4408 San Fernando Rd., Glendale 4, Calif. The grinder is supplied complete with a protractor fixture and adjustable spacer that is adjustable to various length drills. The motor is mounted on a lightweight sturdy metal base for ease of installation and handling.

Severance Ground Carbide Die-Machine File

With the Severance Ground Carbide Die-Machine File now being marketed by Severance Tool Industries, Inc., 724 Iowa St., Saginaw, Mich., alterations or corrections on hardened dies (as hard as Rockwell 63C) can be readily made, it is claimed. The file can be used in diemaking, finishing parts, templets, production pieces, toys, and on most any material where a relatively straight surface is to be worked.

The Severance Ground Carbide Die-





Severance Ground Carbide Die-Machine Files

Machine File is offered in several sizes in four standard shapes; namely, round, square, rectangular, and triangular. The file is recommended chiefly for use on die-filing machines, but can be used manually or in practically any reciprocating device or manner.

Ipco "Speed-Up" Safety Vacuum Lifter

Designed for lifting, feeding, and positioning sheets of metal and other materials in stamping machines and die presses, the Ipco "Speed-Up" Safety Vacuum Lifter shown in the accompanying illustration has been placed on the market by the Industrial Products Co., 2999 N. Fourth St., Philadelphia 33, Pa. According to the manufacturer, the lifter eliminates danger to the operator while positioning blanks in forming presses since it can be used to accurately set workpieces to gages or stops without in-

serting hands or fingers in the danger zone.

Time-saving and practical in transferring metal blanks from piles or stacks, especially when oily or greasy and when difficult to grasp with the fingers, the Ipco Speed-Up Safety Vacuum Lifter may be used with equal success on other non-porous materials, as well as blanks of curved contour, fiber, tinplate, plastic, linoleum, and other rigid materials, it is claimed. The lifter is employed by striking the rubber cup against the material to be handled. This action produces a vacuum within the cup which is said to be retained until the cup is released by depressing a conveniently lo-



AMAZING all-purpose ELECTRIC TOOL will

- Drill up to 1/4" dia.
- Ream up to 1/2" dia.
- Tap up to 1/2" dia.
- Run Nuts up to 3/4" dia.
- Drive Screws up to 3/4" dia.
- Hole Saw up to 1 1/2" dia.
- Bore Wood up to 1 1/2" dia.
- Drive Studs up to 3/4" dia.
- Drill Masonry up to 3/4" dia.
- Extract Broken Studs up to 3/4" dia.
- Wire Brush up to 3/4" dia. shanks.

(Uses Standard Attachments)
(110 V or 220 V Models available)

**Make it the ONLY all-purpose
Electric Tool**

The tremendous power of the "rotary impacts" performs a multitude of operations not possible with any other electric tool. What's more remarkable—there is no kick—no twist to the operator.

The IMPACT Tool is the greatest labor-saving, time-saving portable power tool ever offered. It will save up to 90% of the time on nut running operations alone.

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for Overarms
2 1/4" to 3 1/2".
No. 7 B & S Spindle.
Collet Capacity 1/4".

only \$195.

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Collet Capacity 3/4".

only \$295.

Parts and Collets for all HALCO Heads
Quick Delivery—Order NOW!

Veet Manufacturing Co.
EAST DETROIT MICHIGAN

cated trigger. The cup is held to the handle by a concealed soft brass bolt which is molded in the rubber, and can be quickly and easily replaced when necessary.

The Ipco Speed-Up Safety Vacuum

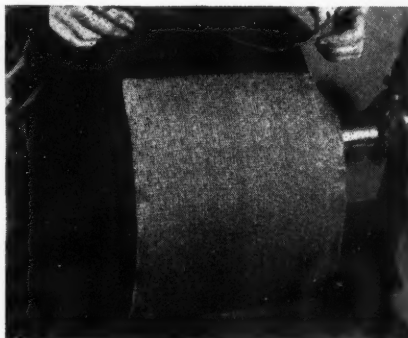


Ipco "Speed-Up" Safety Vacuum Lifter in Use

Lifter is 15 inches long overall and measures 1 1/2 inches high at the cup end. The unit weighs 4 1/2 ounces.

Condersite Waterproof Pulley Lagging

An all-purpose waterproof pulley lagging which, it is claimed, can be quickly and easily applied without rivets, bolts, or heat and dries within 10 hours at room temperature is now being produced by the Condersite Engineering Corp., 2015



Condersite Waterproof Pulley Lagging

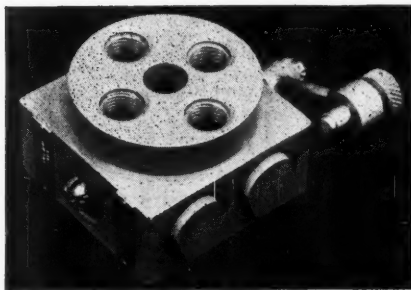
Chancellor St., Philadelphia 5, Pa. According to the manufacturer, the lagging adheres so firmly to all surfaces that a hammer and chisel are required to re-

move it. In addition, it is said to be weather and corrosion resistant and unaffected by sulphuric acid, oxidizing agents, soaps, alcohol, petroleum products, and so on. When dry, the material is claimed to be odorless, non-toxic, and non-inflammable.

Condersite Waterproof Pulley Lagging is designed to provide a frictional surface which is said to assure maximum transmission efficiency and belt life by eliminating belt slippage. It is equally suitable for crown, split, and flat pulleys utilizing leather, cord, wire-woven, or rubber belts. The lagging consists of a high quality mineral base fabric and waterproof compound and may be obtained in units comprising 70 x 40-inch treated fabric and sufficient compound for application, cut to size for any pulley by specifying diameter and face measurements, or in rolls of any width up to 42 inches.

Electrol 4-Way Selector Valve

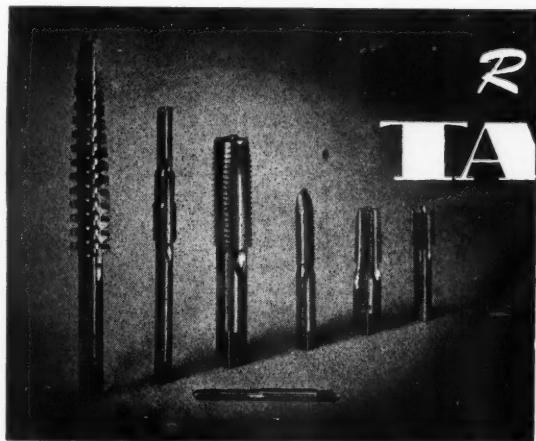
Electrol, Inc., Dept. MMS, Kingston, N. Y., has developed a 4-way selector valve which is said to provide a simple, convenient means for controlling flow to



Electrol 4-Way Selector Valve

the remote actuating cylinders of hydraulic systems.

Light, compact, and ruggedly constructed, the valve consists of an aluminum alloy body having four line connections, and includes a group of conventional spring-loaded balanced type poppet valves interconnected by ducts which direct the fluid to the desired channel. Actuated by cams, the valves are so arranged that rotation of the camshaft opens the proper combination of poppets to direct the fluid through the valve to



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TAPS**

Give long life, dependable service and are the favorite with hundreds of the largest and most exacting users.

Buy Reiff & Nestor Taps and get the benefit of wide experience, progressive engineering and precise workmanship.

Our stepped up production enables us to make prompt deliveries on both Standards and Specials.

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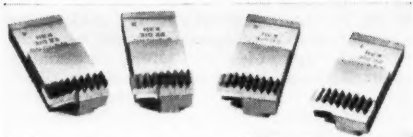
manufacturers of TAPS AND REAMERS

LYKENS, PA.

the desired location. A position stop pin is said to prevent overrunning of the camshaft. Efficient ducting of the fluid and reduced pressure drop are claimed to be assured by coaxial assembly and adequate passage size.

Jones & Lamson Carbide-Tipped Die Chasers

Carbide-tipped die chasers with ground thread forms for selected applications on turret lathes, automatics, and threading machines are now available from the Jones & Lamson Machine Co., Dept. 710



Jones & Lamson Carbide-Tipped Die Chasers

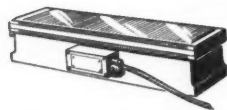
Springfield, Vt. In addition to increasing threading speeds, the long life of the chasers provides for unusual economy when they are suitably applied and correctly handled, the manufacturer states.

The chasers are claimed to be particularly effective in steel and still more efficient in hard rubber, fiber, and abrasive materials when used on machines with sufficient power, speed, and rigidity to handle carbide tooling effectively.

Investigate

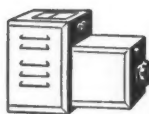
CHUCKING

with the SPEED of ELECTRICITY



MAGNA-LOCK LAMINATED CHUCKS

Two types, STANDARD and the ultra-powerful SUPREME — both with all steel laminated top plates—patented hermeti-coil waterproof construction. MAGNA-LOCK chucks give you 22% more working surface—uniform, pull—sizes from 4x6" to 30x96". And ask about special chucks, top plates, parallels and V-blocks.



NEUTROFIER

For faster, more efficient magnetic chucking—this new combination Rectifier and Demagnetizer will help you lower production costs.

Let Laminated **MAGNETIC CHUCKS** by Hanchett Set New Production Standards for You.

The Hanchett magnetic chucking method lifts the limit off production speeds for small parts finishing. Check your shop for machining operations where chucking and set-up time cuts into profits. Find out whether completely automatic "hands-off" production would boost your net. Then drop us a card. We'll help you apply Hanchett Magnetic Chucking to your grinding, milling, drilling, shaping operations. . . .

Ask for Bulletin MM-108



Hanchett MAGNA-LOCK CORP.

Magnetic Chucks and Devices

BIG RAPIDS

MICHIGAN

T.A.C. Open-End Ratchet Wrench

An open-end ratchet wrench for use on pipe, tube, conduit, cable, and rod fittings is now being marketed under the designation of T.A.C. by the C. J. Hendry Co., 27 Main St., San Francisco, Calif. The ratchet head is arranged to operate in a 7½-deg. arc or less, thus making the wrench ideal for use in restricted areas.

Originally designed for shipboard use, the T. A. C. Open-End Ratchet Wrench is claimed to possess time-saving qualities that make it applicable in the aircraft, automotive, railroad, petroleum, electrical,



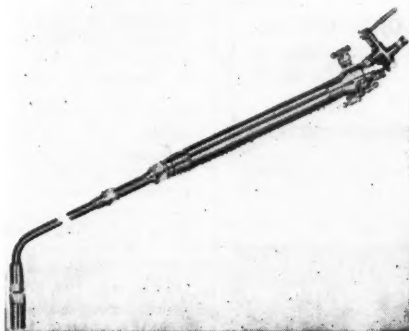
T.A.C. Open-End Ratchet Wrench

and other industries. T.A.C. ratchet heads, sockets, and accessories may be obtained separately or in sets in practically any desired sizes. An adapter available also makes it possible to use standard sockets with the T.A.C. ratchet head.

Weldit Welding and Heating Torch

Utilizing two tanks of acetylene and one tank of oxygen, a three-hose welding and heating torch which is said to be of particular advantage in welding, heating, or brazing broken parts on heavy machinery, expanding tie rods, heavy press installations, bending large diameter pipes, and maintenance work is now being produced by Weldit, Inc., 990 Oakman Blvd., Detroit 6, Mich. An outstanding feature of the torch is the quick-acting oxygen cutoff which is designed

Weldit Welding and Heating Torch



YOUR WORKMEN WILL LIKE THESE...

HALLOWELL

READY-MADE AND FIRE RESISTANT
WORK-BENCHES of STEEL



Fig. 732
Pat'd. and Pats. Pending
Drawer is extra.

Thousands upon thousands of "Hallowell" Benches are used in all types of shops throughout the country — because they offer the following advantages: standard heights, widths and lengths . . . several hundred interchangeable combinations . . . easily moved and re-arranged . . . can be joined end-to-end to form one continuous work-bench . . . bench tops are of Steel; Steel covered with "Tempered Presdwood"; or smooth laminated wood.

Write for the name and address of your nearest "Hallowell" Industrial Distributor, and for your copy of the "Hallowell" Catalog.

OVER 45 YEARS IN BUSINESS

STANDARD PRESSED STEEL CO.

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Herman Granite Straightedge

Herman Granite Straightedge

to instantly and automatically shut off the oxygen supply. The torch is also supplied with a two-valve control for using propane, natural, or manufactured gas and oxygen for heating purposes.

The Weldit Welding and Heating Torch includes a sturdy brass handle and Monel tip-tube. The torch is 51 inches long overall, weighs 6 lb. and 12 ounces.

Designed to eliminate the necessity for continual rechecking, a straightedge made of granite is announced by The Herman Stone Co., 324 Harries Bldg., Dayton 2, Ohio. According to the manufacturer, the straightedge is made to an accuracy of 0.0001 inch every 3 feet and is approximately the same weight as the conventional cast iron straightedge.

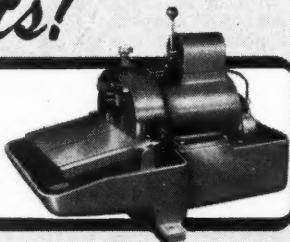
The Herman Granite Straightedge is available in sizes up to 6 feet and is equipped with handles for easy use.

THIS CARBIDE GRINDING TEAM

Cuts Costs!

WICKMAN-NEVEN BENCH GRINDER

—designed especially for grinding or lapping carbide. Has special reversible 1 HP motor, 12 gal./hr. coolant pump, easily adjustable table, swiveling wheel guard.



STEEL-BONDED DIAMOND WHEELS

—practically indestructible with extra long life. Diamond particles stay in place until completely worn. Finish tools better for longer tool life.

RESINOID-BONDED DIAMOND WHEELS

—for faster and freer carbide cutting and less frequent wheel dressing.

STEEL-BONDED CHIP-BREAKER DIAMOND WHEELS

—with many times the service life of other chip-breaker diamond wheels. Reduce wheel and tool costs materially and speed grinding 3-4 times.

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Complete information on these Wickman products is yours for the asking. Write today.

THE Wickman
MANUFACTURING CO.

15533
WOODROW WILSON AVE.
DETROIT 3, MICHIGAN

Aro Model 7072 Balancer

A balancer for suspending portable tools in shop or production line work is announced by The Aro Equipment Co., Dept. MMS, Bryan, Ohio. Designated as the Model 7072, the balancer can be easily and quickly adjusted for correct balance on all types of portable tools weighing up to 10 pounds.

Use of the Aro Model 7072 Balancer is said to help increase worker efficiency by keeping workspace clear of hose or cords, yet with the tool right where the operator wants it for instant use. The unit is designed to provide in-line suspension of tools. The cable extends out of the bottom of the balancer in line with the suspension eye, thus eliminating the



**Aro Model 7072
Balancer**

necessity of twisting or turning the balancer.

Sturdy, lightweight construction of the unit is said to be achieved through the use of an all-steel stamped housing and drum. A high temper spring is claimed to ensure long life and trouble-free service. The balancer can be easily adjusted to lower tension by simply moving the spring trigger located on the shaft. To increase tension, the shaft is wound

clockwise with an adjustable open end wrench. Worn cables can be replaced by inserting a new cable through the bottom opening into the drum and rewinding.

The Aro Model 7072 Balancer is supplied complete with 6 feet of preformed wire cable, rubber bumper, and cable clamp for adjustments at any level.

Extension Parallels for Moore Jig Borers and Grinders

Extension parallels for use with Moore jig borers and jig grinders to increase effective table size have been announced by the Moore Special Tool Co., Inc., 730 Union Ave., Bridgeport 7, Conn. Furnished in sets of four, they are said to accommodate work almost twice table size with no loss in accuracy of table settings, thus considerably widening the range of application of the jig borers and grinders, which utilize precision lead screws to locate holes by the coordinate method.

With the extension parallels, the Moore jig grinder and Models 1 and 2 jig borers are said to easily handle work 5 inches larger than table size in both directions or work 10 inches larger in only one direction. The table size of the Model 1 jig borer and of the jig grinder is 10 x 18 inches; the table size of the Model 2 jig borer is 10 x 19 inches. When the extension parallels are applied, the capacity of the 10-inch rotary table for circular parts used with all three machine tools can likewise be effectively increased to accommodate rings more than 20 inches in diameter.

The extension parallels are designed to afford ample drill clearance and are pro-

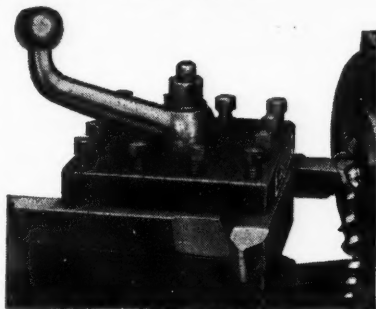
ACCURATE WITHIN .0005"

Enco LATHE TURRETS

Enco Lathe Turrets re-index to the same position within five ten thousandths. Piece after piece can be machined with complete confidence in production precision.

There are no pins or bushings in Enco Toolpost Turrets to wear "egg shaped" or out of alignment. This ability to "come back" accurately makes Enco users come back for more turrets.

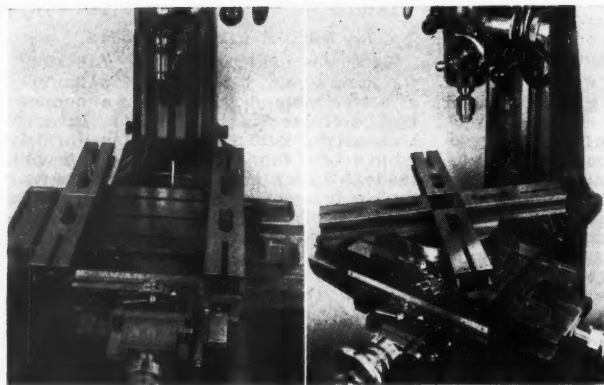
*Also Mfrs. of Enco Hexturret Bed Turret
for 9" to 16" Lathes.*



- 12 POSITION INDEXING
- 3 WORKING POSITIONS FOR EACH TOOL
- HARDENED STEEL CONSTRUCTION
- MOUNTS RIGIDLY IN COMPOUND T-SLOT
- KEEPS SETTING ACCURATELY
- INDEXING IS SELF-CONTAINED. ELIMINATES ALL CHIP INTERFERENCE

ENCO MANUFACTURING COMPANY

Dept. 1108 — 4522-24 W. Fullerton Ave., Chicago 39, Illinois



(Left) Extension Parallels Bolted to Table of Moore jig Borer to Accommodate Die More Than Twice Table Size. (Right) Extension Parallels Used With 10-Inch Rotary Table to Accommodate Rings over 20 Inches in Diameter

vided with T-slots for clamping dies in place. The parallels are made of close-grained Meehanite and are each 2 inches thick x 3 inches wide x 10 inches long.

3P Head Type Punch

A head type punch made from select tool steel which is precision machined, heat treated, ground and Brinell tested is now

being marketed under the designation 3P by Diemaker Supplies, Inc., Dept. 37, 2779 E. Grand Blvd., Detroit 11, Mich. Said to produce a maximum number of slugs per grind, the punch, in the first

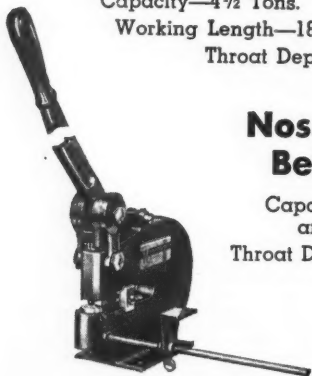
four series, is furnished in a minimum length of 1½ inches, thus providing for an unusually wide range of application. Any point size between listed sizes can be readily furnished on special order. A round type retainer for the 3P Head Type Punch is optional in two sizes and is furnished in a high tensile steel, which is machinable. The retainer allows for a light press fit on the punch body so that the punch is held firmly, with de-

WHITNEY-JENSEN PRODUCTS

30 YEARS EXPERIENCE

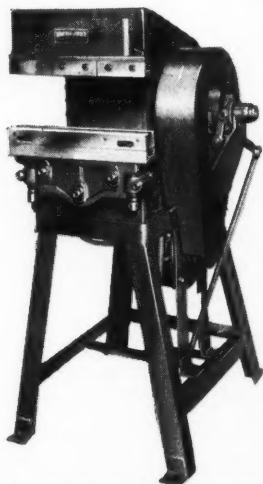
No. 247 -- 18" Power Press Brake

Capacity—4½ Tons. Speed—47 RPM.
Working Length—18". Stroke—1".
Throat Depth—6¼".



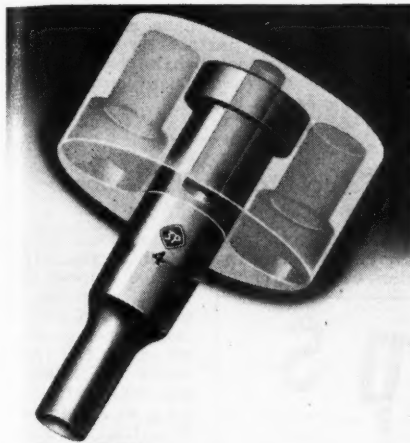
Nos. 16 and 17 Bench Punch

Capacity—⅜" thru ¼"
and ¼" thru ¼".
Throat Depths—3½" and 6½".



WHITNEY METAL TOOL COMPANY

110 FORBES ST. • ROCKFORD, ILL.



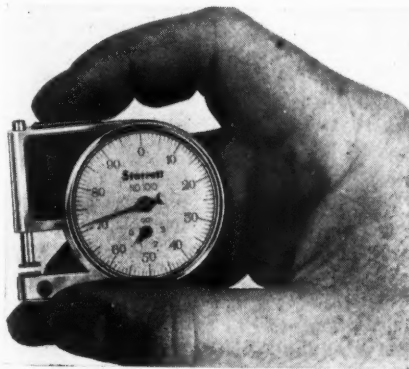
3P Head Type Punch

structive shattering action reduced to a minimum, thereby providing for long die and punch life, it is claimed.

Starrett Vest Pocket Dial Indicator Gage

Described as being no larger than a thin pocket watch, the Starrett Vest Pocket Dial Indicator Gage illustrated herewith, product of The L. S. Starrett Co., Athol, Mass., is designed to provide a handy means for measuring and comparing thicknesses of sheet metal, wire,

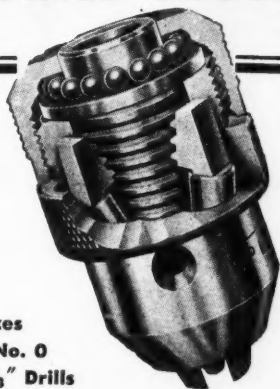
Starrett Vest Pocket Dial Indicator Gage



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Ettco

KEYLESS DRILL CHUCKS



5 Sizes

For No. 0

to 5/8" Drills

Drill changes are lightning quick and require little effort with Ettco Keyless Drill Chucks. There are other savings, too — Ettco Chucks have an automatic tightening action which assures a firm and rigid grip of the drill at all times, prevents damaged shanks, and eliminates time spent in retightening. These time and strength-saving features make Ettco Drill Chucks ideal for shops that want top drilling output at lowest cost.

WRITE FOR BULLETIN NO. 6

It gives details of these high-quality precision made chucks. Free copies on request.

ETTCO TOOL CO.

598 Johnson Ave.

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Boston, Massachusetts

• Portland, Connecticut

Detroit, Michigan

• Chicago, Illinois

plastics, paper, leather, rubber, and so on. The gage is said to be especially useful to inspectors, salesmen, purchasing agents, and stock clerks making a variety of quick measurements.

Constructed to fit into the curve of the thumb and index finger, the gage includes a large easy-reading dial graduated to read in thousandths of an inch. A small "tell tale" hand records revolutions of the larger hand up to the maximum range of $\frac{3}{8}$ inch. The spindle is raised by sliding a serrated plate at the top edge of the gage.

The Starrett Vest Pocket Dial Indi-

cator Gage is precision made with a die cast, chrome plated case and stainless steel component parts. The dial crystal is said to be non-breakable. Decimal equivalents of fractions are provided on the back of the gage.

Sample-Marshall Diamond-Bonded Tools

A line of diamond-bonded tools utilizing the African diamond in a concentration of approximately 1,400 coarse dia-

mond particles to every square inch is now being offered under the trade name of Sample-Marshall by the Triangle Equipment Co., Inc., 45 River Rd., Nutley, N. J. The line comprises files for use on ceramics, tungsten, molybdenum, glass, and so on; mounted tools for use on hardened metals and in the light finishing of soft metals, as well as routine operations on cemented carbides, quartz, glass, and ceramics; and wheels for surface grinding at speeds from 4,500 to 6,000 surface feet per minute, shaping and sharpening cemented carbide tools, shaping glass, quartz, and ceramics. Special drills, counterbores, and reamers for ceramics, glass, and quartz can also be obtained.

According to the manufacturer, the method of binding the diamond grits to each tool is such that each diamond particle is set individually on the working surface and embedded in such a manner



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PRODUCTION
and **LOWER COSTS**

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the Milford
free engineering service



2. Choose

one of 15
basic Milford
rivet setting
machines —
offering
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versatility.



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exactly the right semi-
tubular or split
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complete line.

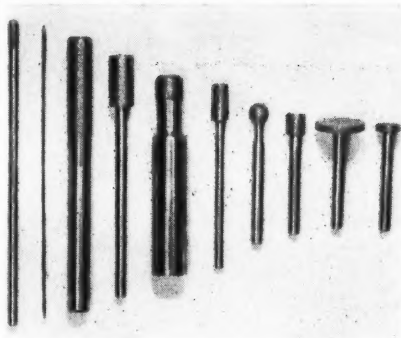


MILFORD

1000 MERWIN ROAD
MILFORD, CONN.

RIVET & MACHINE CO

1000 WEST RIVER ST.
ELYRIA, OHIO



Sample-Marshall Diamond-Bonded Tools

as to support the adjoining particles. The diamond-support-diamond setting is said to produce a rim that reduces wear and diamond change to a minimum. The close relationship of diamond to diamond also provides for a high percentage of particles on the working surface and is claimed to afford maximum cutting speed and a uniformly smooth action, as well as effect fullest possible economy.

Wilbur & Williams Silicated Traffic Marking Paint

Designed for the marking of industrial safety, storage, and traffic areas, a silicated traffic marking paint which is claimed to be unusually durable and resistant to continual cleaning and to provide the additional safety feature of preventing slipping hazards is now being manufactured by The Wilbur & Williams Co., Greenleaf and Leon Sts., Boston 15, Massachusetts.

According to the manufacturer, the paint can be applied equally well with a brush or line marker and is available in white and yellow in 1 and 5-gallon containers.

Zagar Model "B" Collet Speed Chuck

Designed to rotate on its own ball bearings, thereby providing for maximum holding capacity, the maintenance of accuracy, and the elimination of overhang and chatter, it is claimed, a collet speed chuck designated as the Model "B" is now being marketed by Zagar Tool, Inc., 23880 Lakeland Blvd., Cleveland 17, Ohio.

441 STANDARD SIZES

WORLD'S LARGEST RANGE OF SIZES

KINDS

WATER-DIE

OIL-DIE

AIR-DIE

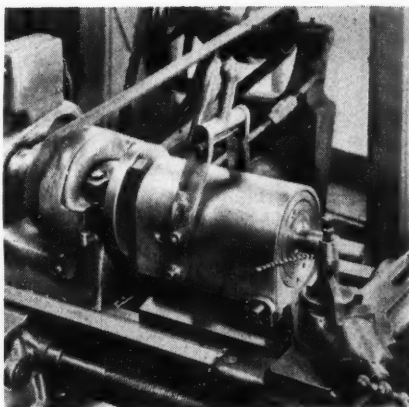
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FREE CATALOG

MARSHALL STEEL CO.
LISLE, ILLINOIS

WRITE BOX 58-C

The chuck derives its turning power from the spindle of the machine to which it is attached. The collet is arranged to remain stationary while opening and closing, thus making it possible to maintain accurate length dimensions on parts being machined. The working mechanism of the collet closing device is located between two precision ball bearings, the long support between bearings providing for maximum accuracy of the chuck.

The Zagar Model B Collet Speed Chuck is designed in 1 and 2-inch through capacities and is made to order to suit any type of lathe, grinding machine, or other



Zagar Model "B" Collet Speed Chuck
Installed on a Lathe

rotating spindle equipment. The 1-inch size utilizes a standard 5C collet and the 2-inch size, a Zagar No. 310 draw type master collet with No. 6 W&S collet pads.

NEEDLE ROLLERS

Manufactured by men experienced in the needle roller field—your assurance of:

Quality! Fast Delivery!
Price! Any size! Any quantity!

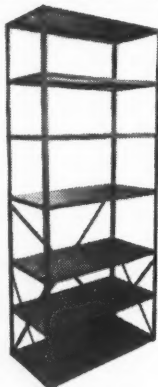


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PROMPT DELIVERY On STEEL SHELVING



Open Type
(Closed type
also available)

Standard Sizes

Special Units Made to
Your Specifications

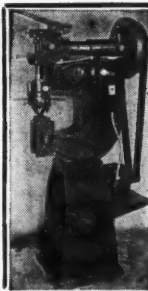
Economical, all purpose, adjustable shelving units for loads from 100 to 150 lbs. per shelf. Dividers available to convert shelving into stock bins, etc.

Write for details
and prices

HILCO MANUFACTURING CO.
1721 Elston Ave. Chicago 22, Ill.

4-in-1 "All White" Skin Cleanser

The manufacture of an industrial hand soap to be known as 4-in-1 "All-White" Skin Cleanser is announced by the Kent Chemical Co., 1600 Linden Ave., Grand Rapids, Mich. Said to completely dissolve, leaving no messy wash basins, clogged drains, or residue on the user's hands, the soap, it is claimed, is extremely bulky and contains no harsh scrubbers or abrasives. Entirely free of corn meal, it is said to be equally suited for use by both men and women due to its gentle action.



**GRAY TURRET HEAD METAL
CUTTER OR NIBBLER**

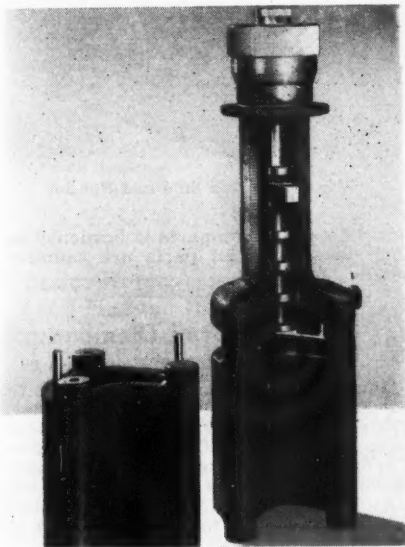
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Most modern Nibbler for
Template Cutting, Tool
Rooms, Shipbuilding, Air-
craft Parts, Aircraft Tub-
ing, Sheet & Plate Shops.

GRAY MACHINE CO.
Box 596, Philadelphia, Pa.

Cadillac "Pla-Chek" Portable 6-Inch Gage

Known as the "Pla-Chek," a portable 6-inch gage designed primarily for the checking of small products is announced by the Cadillac Gage Co., 20315 Hoover Rd., Detroit 5, Mich. Said to be ideal for the checking of gages, tools, and dies either on a surface plate or at a machine, the gage is completely self-contained and extremely simple in operation, it is claimed. Light and easy to carry, the gage can



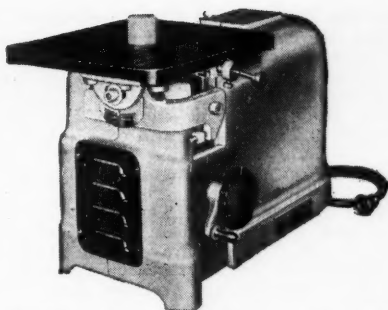
Cadillac "Pla-Chek" Portable 6-Inch Gage
with 6-Inch Risers

be readily checked in and out of the tool crib.

An advantage of the Pla-Chek is the fact that it also can be used on larger jobs without the sacrifice of portability. Its capacity can be increased by the addition of 6-inch risers which do not change the overall accuracy of the gage. The Pla-Chek is claimed to be accurate to 0.00005 inch.

Wespo Improved Stud and Nut Set

A conveniently arranged stud and nut set of improved design is now being introduced under the trade name of Wespo

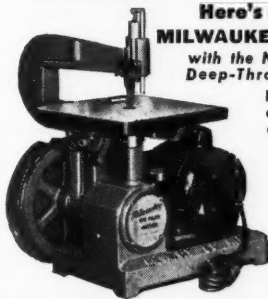


MILWAUKEE PROFILE GRINDER *Precision Built for Precision Work*

Especially built for precision grinding of die clearances; sharpening of cutter dies, contour grinding, production grinding, finish grinding of hardened steel parts. These features tell you why:

- $\frac{1}{2}$ H.P. Ball Bearing Motor — Plenty of power maintains high spindle speeds and full capacity. No stalling!
- Collet Chuck — for fast, easy mounting or removal of wheels; assures absolute true running of carbide or diamond wheels.
- Compound Tilting Table — permits full range grinding of compound angles, curves and contours.
- Built-in Diamond Dresser — always ready for action; no loose parts to assemble; keeps wheels trued-up at all times.
- Your choice of either 20,000 or 30,000 R.P.M. Spindle Speed.

Here's Model F5 MILWAUKEE DIE FILER with the New All-Purpose Deep-Throated Overarm



Performs all three die-making operations . . . filing, sawing, lapping . . . cuts cost 40% to 60%.

Write for Literature on Both Machines and name of nearest dealer.

RICE PUMP & MACHINE CO.

Division of Milwaukee Chaplet & Mfg. Co.

105 S. 40th STREET

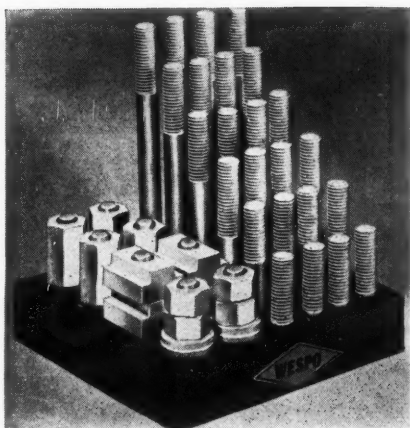
MILWAUKEE 4, WIS.

MILWAUKEE

DIE FILERS • PROFILE GRINDERS

by the West Point Manufacturing Co., 19635 Merriman Ct., Farmington, Mich. The set is available in $\frac{3}{4}$, $\frac{1}{2}$, and $\frac{1}{4}$ -inch standard thread sizes (Class 3 fit) and includes four each of 3, 4, 5, 6, 7, and 8-inch studs and four each of the nuts, washers, T-slot nuts, and coupling nuts.

The coupling nuts are designed to enable the operator to obtain stud lengths from 3 to 16 inches. The specially designed and machined T-slot nuts permit the use of studs to the full capacity of the T-slot. The studs are made of heat-treated alloy steel with threads cut after heat treatment to prevent distortion.



Wespo Improved Stud and Nut Set

The balance of the parts is hardened for long wear, and all parts are cadmium plated.



WADE ENVELOPES
protect
**Shop Orders, Drawings,
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Made in three styles, transparent, fibre, and metal backs. Non-inflammable acetate windows. Special style or size to order. Write for details.

WADE INSTRUMENT COMPANY
Phone: CEDAR 4728
1422 E. 109th St., Dept. M., Cleveland, Ohio

Clark Improved Diamond Penetrators

Two improved diamond penetrators for Rockwell testing are announced by Clark Instrument, Inc., 10200 Ford Rd., Dearborn, Mich. The Clark "C" Diamond Penetrator is designed to fit all makes of hardness testers for standard Rockwell testing, and the Clark "S" Diamond Penetrator is said to fit all machines for superficial Rockwell testing.

According to the manufacturer, both penetrators are carefully designed to provide accurate results. The diamond points are specially selected for proper stratification and freedom from internal stress-

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GEAR & MACHINE CO., gear specialists

For immediate attention. Any quantity, large or small. Send B/P or samples, for prompt quotation. Cut only to specifications. No stocks.

Spur—96 D.P. to 5/7 D.P. $\frac{1}{4}$ " P.D. to 18" P.D.

Bevel—48 D.P. to 5/7 D.P. Max. P.D. 20" —Max. ration 4:1.

Worms—32 D.P. to 5/7 D.P. $\frac{1}{4}$ " P.D. to 5" P.D.

Worm Wheels—32 D.P. to 5/7 D.P. $\frac{1}{4}$ " P.D. to 14" P.D.

Helical & Spiral—96 D.P. to 6 D.P. up to 14" P.D.

Sprockets— $1\frac{1}{4}$ " dia. to 14" dia.

Abart **GEAR & MACHINE CO.**

4819 W. 16th St. • Chicago 50, Ill.
Phone: ROkwell 2-2827

Adjustable Collet Bushing Chuck—

provides an accurate method for mounting centerless armature shafts and similar parts in a lathe. Use in either head or tail spindle. The brass collets are adjustable for running or driving fits. Chucks supplied with 3 collets; 9/16", 5/8", and .637" capacity. Extra round collets, $\frac{1}{4}$ " to 1" by 16ths, \$1.10 each.



Chuck with No. 2 shank . . . \$9.45
Chuck with No. 3 shank . . . \$9.95
L.A.B. factory

SOUTH BEND **LATHE WORKS**

4274 E. Madison St.
South Bend 22, Indiana



Clark Improved Diamond Penetrator

as. The holders are designed and finished to precisely correct angles and radii.

Accurately made to proper size and shape, the Clark Diamond Penetrator is furnished as a standard accessory on all Clark hardness testers, both for standard and for superficial Rockwell testing.

Condor Homo-Flex Heavy Duty Air Hose

The development of Condor Homo-Flex Heavy Duty Air Hose for rugged service has been announced by the Manhattan Rubber Division, Raybestos-Manhattan, Inc., Passaic, N. J. According to the manufacturer the hose has an extra strong tube compounded of Manhattan oilproof Flexlastics, two braids of heavy strength member, and a thick abrasive resistant oilproof Flexlastics cover, yet retains a high degree of flexibility.

The hose is available in two sizes with $\frac{3}{4}$ and 1-inch inside diameters and working pressures of 350 and 300 pounds.



Exclusive "Tru-Grip" Tap Holder is lighter, smaller in diameter.

WRITE FOR FREE CIRCULAR

Procunier

Safety Chuck Company

12 S. Clinton St.,
Chicago 6, Ill.

"Kop-R-Tube" Insert Roll Die

An insert roll die for marking copper or brass pipe and tubing is now being manufactured by the M. E. Cunningham Co., 158 E. Carson St., Pittsburgh, Pa. Identified as the "Kop-R-Tube," the die can be furnished for use in marking machines or in standard coiling machines used for coiling copper tubing. It is grooved to suit the size of tubing to be marked and is provided with a recess slot for changeable marking die inserts which can be easily and quickly changed as they become worn.

This Tapping Head

CUTS PRODUCTION COSTS!

Reduce labor costs and cut down tap breakage with Procunier High Speed Tapping Equipment. Check these unusual advantages:

Accurate, high speed tapping. Procunier tap heads will give you cleaner, sharper threads . . . in less time, with less spoilage.

Fewer broken taps. Friction clutch regulates tap driving pressures, operators quickly detect dull or "loaded" taps . . . avoiding costly tap breakage.

These and many other *proven* exclusive features assure you of fast, accurate tapping . . . reduced production costs.

Cross section of tap holder (at left) shows how tap is held by the round, driven by the square . . . tap shanks are never "chewed up."

Procunier Safety Chuck Co.,
12 S. Clinton St., Chicago 6, Ill.

Gentlemen: Please send me your illustrated brochures which give complete prices and specifications on Procunier High Speed Tapping Heads & Machines.

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Screws



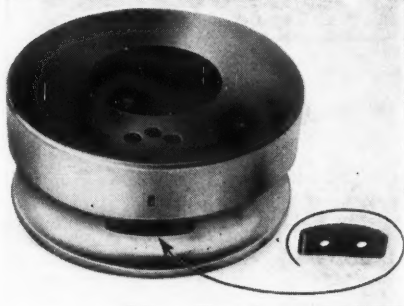
Socket
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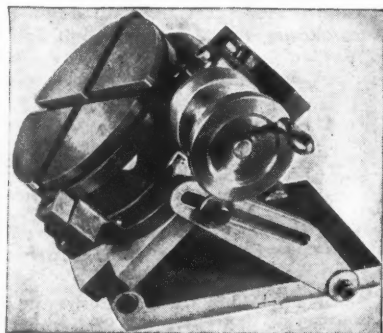
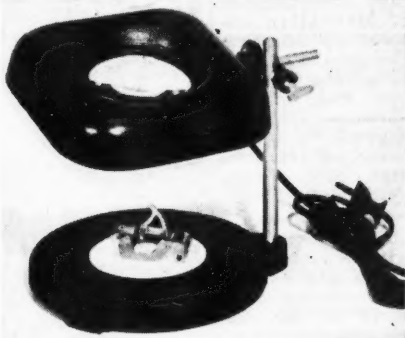
"Kop-R-Tube" Insert Roll Die

Machined to precision specifications, the Kop-R-Tube Insert Roll Die is made to suit machines now in use and includes a ball bearing to provide for maximum efficiency. The die can be designed for any special machine and is available for tubing $\frac{1}{4}$ inch in size and larger.

Montgomery Bench Type Magnifier

A bench type magnifier featuring a screw device which permits the magnifier to be attached with an ordinary thumbscrew movement to any shaft or rod up to $\frac{1}{2}$ inch in diameter is now being marketed by Montgomery & Co., Inc., 53 Park Pl., New York 7, N. Y. Designed to reduce eyestrain to a minimum, the magnifier is claimed to be particularly useful for such work as reading machine

Montgomery Bench Type Magnifier



5 IN. ROTARY TABLE ON ADJUSTABLE ANGLE PLATE

for
SMALL and FINE CIRCULAR MACHINING
CAN BE PURCHASED SEPARATELY

Accurate — Dependable

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We Also Make Four Larger Sizes.

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482 Canal Street

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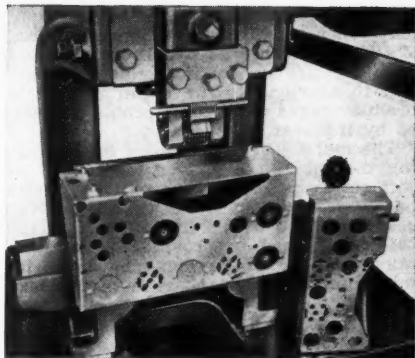
tool dials or rigging on special fixtures, as well as various other applications.

Specifications of the Montgomery Bench Type Magnifier are as follows: glass diameter, 3 inches; glass power, 3.25; illumination, 4-bulb; and current, alternating or direct.

Acromark Adjustable Stamping Fixture

An adjustable stamping fixture adaptable for use in any standard press is announced by The Acromark Co., 9 Morrell St., Elizabeth 4, N. J. The fixture consists of a casting on which is mounted adjustable steel slide blocks that permit the stamped part to be numbered on the end and again on the side in two successive press strokes. To accomplish duplicate numbering, a duplicating fixture for operating the actuating arm of the numbering head is added.

Adjustment of the Acromark Stamping Fixture can be readily made by the loosening of screws. Particularly adaptable to use in the numbering of instrument and radio chassis, the fixture, as illustrated, is designed to hold stamped



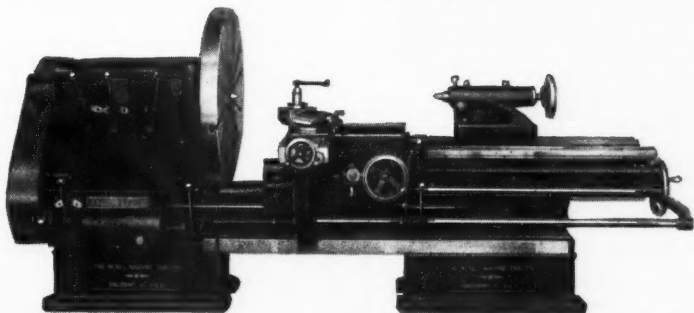
Acromark Adjustable Stamping Fixture in Use

parts having one or more flat surfaces ranging in size from 1 x 2 to 4 x 10 inches.

Elgin "Tipt-Type" Sapphire Gage

Known as the "Tipt-Type," a gage with approximately $\frac{1}{4}$ -inch sapphire tip metallically bonded to the leading end of the

Extension Bed Gap Lathes



Illustrated is the Series "AG" 20/40" Extension Bed Gap Lathe. Also made in 28/50" Heavy Duty.

The Extension Bed Gap Lathe is designed to be used either as a gap lathe or an engine lathe.

We also manufacture a line of regular geared head engine lathes.

Write for circulars.

The Nebel Machine Tool Co.

CINCINNATI, OHIO

steel member is announced by the Sapphire Products Division, Elgin National Watch Co., Aurora, Ill. This construction is said to provide for maximum economy and to also enable the manufacturer to produce gages of extra length as requested by the user.

The metal leader is bonded to the gaging member by a conventional hard or soft soldering method after the sapphire has been metalized by an exclusive process. Combined with a flexible handle, the tool is claimed to provide for a maximum number of gagings per day with minimum operator fatigue and to necessi-



Elgin "Tipt-Type" Sapphire Gage

tate no wear tolerance, thus opening manufacturing tolerances. The gage is available in sizes ranging from 0.020 to 1.000 inch.

Waldes "Truarc" Bowed "E" Retaining Ring

To assure the accurate positioning of a series of gears and spacers used in counter gear assemblies of business machines, Waldes Kohinoor, Inc., 47-10 Austel Pl., Long Island City 1, N. Y., has developed the Waldes "Truarc" Bowed "E" Retaining Ring. The unit is a three-prong ring bent like a bow out of its plane at about its horizontal center line to a degree corresponding to the maximum end play as conditioned by existing tolerances.

As shown in the accompanying illustration, the gears and spacers are assembled between a "flat" Truarc Standard "E" Ring and a Bowed "E" Ring. The latter takes up end play while having sufficient resiliency to permit the gears to turn freely. Constant alignment of parts and

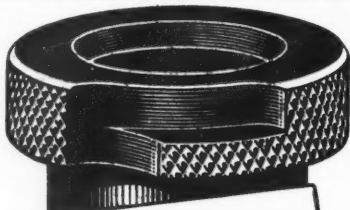


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Yohe racks save floor space, hold more stock, require less lifting. Capable of holding 10,000 and 12,000 pounds for bars 10 to 20 feet long.

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COLONIAL
DRILL JIG BUSHINGS

Ball Bearing Live Center

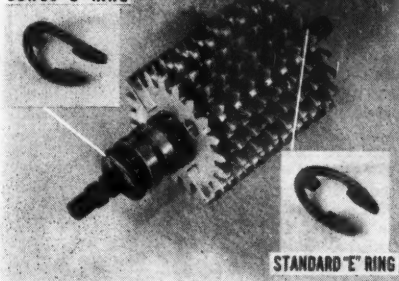
Designed for maximum strength and rigidity, the Ball Bearing Live Center is recommended for high speeds, heavy roughing cuts, etc. 60 degree point runs in substantial precision ball bearing which is easily replaceable.



Center with No.
2 taper shank \$13.75
With No. 3 shank \$16.25
f.o.b. factory

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427A E. Madison St.
South Bend 22, Indiana

BOWED "E" RING



STANDARD "E" RING

Illustration Showing Manner in which Waldes "Truarc" Bowed and Standard "E" Rings are Used to Assure Accurate Positioning of Multiple Gears on Grooved Shaft

accurate meshing of gears under proper tension are thereby said to be assured.

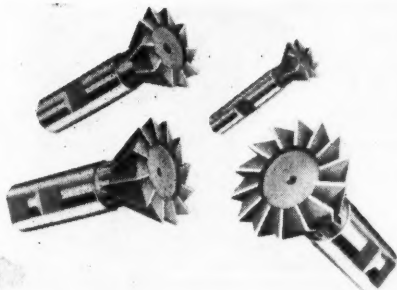
Truarc Standard and Bowed "E" Rings are manufactured in a wide range of sizes and are designed for quick and easy installation on grooved shafts in a radial direction. No special tools are required for assembly or disassembly.

Weldon Angular Cutter

For cutting dovetails and similar work, The Weldon Tool Co., 3000 Woodhill Rd., Cleveland 4, Ohio, is offering a shank type angular cutter which is said to be particularly useful in the toolroom and other milling departments. Designed to reduce set-up time to a minimum, the cutter is recommended for use in Weldon end mill holders but may also be readily used in collets.

Furnished in a 60-degree angle and

Weldon Angular Cutters



It's NEW!



It's a "Knock-Out"

8 MODELS from 1/4" to 7/8" Complete
with the POPULAR
"Knock-Out" KEYLESS CHUCK

From the lightweight, streamlined 1/4" model (illustrated) to the 7/8" brute these 8 new drills are designed and engineered for speed and power. Ball bearing mounted motors; heat treated, alloy steel gears; balanced for easy operation; equipped with "K-O" Keyless Drill Chucks. These are some of the outstanding features of the NEW "KNOCK-OUT" PORTABLE ELECTRIC DRILLS.

Choose the one that fits your needs. Mail the coupon TODAY for complete details of the NEW "K-O" Portable Drills PLUS two new "K-O" 7" Sanders and Grinders.

and a NEW "K-O" BENCH GRINDER...

This Six Inch Utility Bench Grinder is precision built with a powerful motor fully enclosed, dynamically balanced, equipped with oversize ball bearings. Complete with 2 grinding wheels, "K-O" Abrasive Wheel Dresser and adjustable tool rests. Mail the coupon TODAY for complete details.



K. O. LEE CO., 1114 First Ave. S. E.,
Aberdeen, South Dakota

Gentlemen:

Please send your illustrated catalogue showing all the NEW "K-O" Portable Drills, 7" Sander and 6" Bench Grinder.

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right-hand cut, the Weldon Angular Cutter is offered in four cutter diameters of $\frac{1}{8}$, $1\frac{1}{8}$, $1\frac{1}{2}$, and $2\frac{1}{4}$ inches with cutter widths of $\frac{1}{8}$, $\frac{1}{4}$, and $1\frac{1}{8}$ inches respectively, shank diameters of $\frac{3}{8}$, $\frac{1}{2}$, $\frac{3}{4}$, and 1 inch respectively, and overall lengths 1 inch respectively, and lengths of $2\frac{1}{2}$, $2\frac{3}{4}$, $3\frac{1}{4}$, and $3\frac{3}{4}$ inches respectively.

Ridermikrokator

Product of The Swedish Gage Company of America, 8900 Alpine Ave., Detroit 4, Mich., the Ridermikrokator illustrated herewith is intended for checking out-of-

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BUSHINGS**



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When you order drill jig bushings, there's no doubt about what you want. Assured precision, a source that offers you immediate delivery on a full range of standard sizes and prompt service on specials — ACE Gives You All This.

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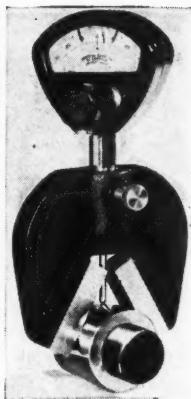
Ask for catalog containing the exclusive "TIME SAVER TABLE."

WEST COAST AERO TOOL CO.
5403 Fountain Avenue, Los Angeles 14, Calif.

roundness and diameters of cylindrical parts. Since the measurements are made according to the three - point principle, the instrument can be used to good advantage for checking centerless-ground pieces.

The Ridermikrokator utilizes frames which are made of malleable cast iron and provided with hardened, ground, and lapped anvils and insulating grips. The measuring surfaces of the anvils can be tipped with cemented carbide. Since the angle between the anvils is 60 degrees, the difference in radius between the setting gage and the work is measured, and the tolerance pointers of the Mikrokator should, therefore, be used only to half the limits required.

The measuring instrument is a standard Mikrokator No. 200 which is locked in the frames by a screw. The instrument is supplied complete with a removable measuring point No. 524, sizes 1 and 2.



Ridermikrokator

Kester "Resin-Five" Core Solder

The Kester Solder Co., 4201 Wrightwood Ave., Chicago 39, Ill., announces the development of Kester "Resin-Five" Core Solder for all types of electrical and electronic soldering operations. According to the manufacturer, the solder is non-corrosive, non-conductive, and virtually odorless, and can be easily used to solder zinc, brass, nickel silver, nickel

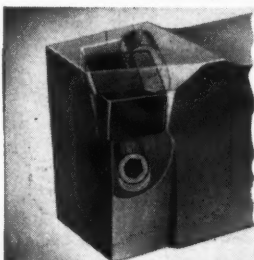
VIKING INSERTED SOLID CARBIDE TOOLS WITH MECHANICAL LOCK

A modern tool holder designed especially for efficient, economical use of solid carbide inserted drill bits. Eliminates ground in chipbreakers and brazing strains. Provides quick change tool bits and low reconditioning costs.

Shank dimensions from $\frac{3}{4}$ " x $\frac{3}{4}$ " x $4\frac{1}{2}$ " to $1\frac{1}{2}$ " x 2" x 7".

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VIKING TOOL CO., SHELTON, CONN.



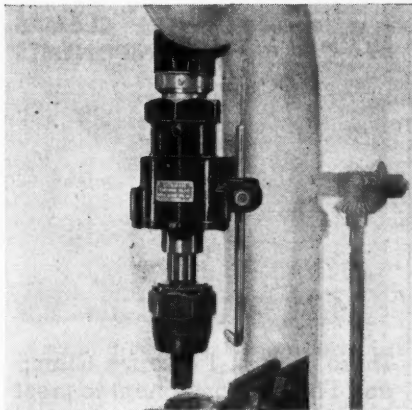
plate, copper, and ferrous alloys.

Kester Resin-Five Core Solder, it is claimed, is not a mixture of rosin with another flux but a resin involving chemical interaction at the anhydride structure of the rosin itself, converting it from a naturally inactive state to an active state and yet preserving its original non-corrosive and electrically non-conductive physical character.

Dorman Heavy Duty Automatic Reverse Tapping Attachment

The Dorman Machine Tool Works, 36 S. Mac Questen Pkwy., Mount Vernon, N. Y., is now introducing a heavy duty, positive gear drive, automatic reverse tapping attachment for use in back geared drill presses. The attachment is designed to drive and automatically reverse $\frac{1}{4}$ to 2-inch pipe taps and the same capacity standard hand or machine screw taps.

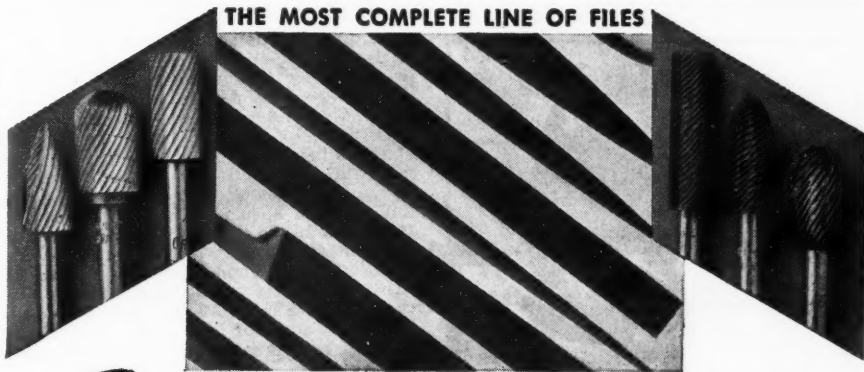
The tap holder is of the collet type, with the tap held by its round shank and driven by its square end. The at-



Dorman Heavy Duty Automatic Reverse Tapping Attachment

tachment is claimed to be particularly suitable for long run production tapping operations using large type taps.

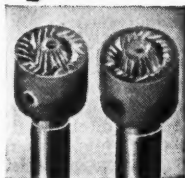
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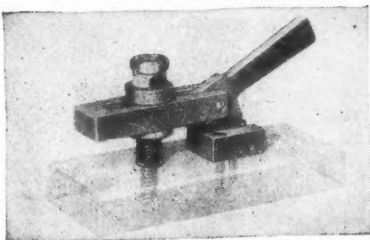
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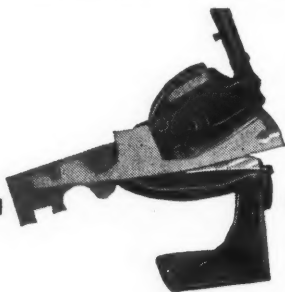
There is a M-T Fixture Clamp and Fixture Component to meet your most exacting requirements. Immediate delivery.

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Cuts straight and irregular shapes faster—better! Order No. 1 for 14 ga. (with High Carbon, High Chrome Blades for 18 ga.); No. 2 for 10 ga. (with H.C.H.C. blades for 14 ga.); and No. 3 for $\frac{1}{8}$ " mild steel or 10 ga. stainless. Write for catalog!

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3000 W. 111th St., Dept. 3, Chicago 43, Ill.

Cogmatic Flame Machining Process

Fast replacement of worn cast iron or cast steel sprockets and gears is now possible through an economical method of flame machining announced by the Cogmatic Co., 757 N. Water St., Milwaukee, Wis. With the process, sprockets are said to be flame machined from steel plate in as little time as 5 minutes for a 12-inch sprocket. Other cutting times vary, depending upon the diameter, thickness, and characteristics of the metal.

Employing a pantograph principle, an oxyacetylene cutting head assembly, mounted on a track is moved forward and backward by mechanical linkage. Such movement is transmitted by following the contour of one of 20 basic cams, the design of which reflects standard and special sprockets and gears. This cutting head is led into the path of a revolving steel blank, whose turning rate is related to the speed of the cutting head.

A $\frac{1}{2}$ h.p. motor with a variable speed control to ensure even burning moves all parts. As each tooth is cut, four gradual accelerations and decelerations in amplitudes of 4 to 1 are required and, when cutting as many as 14 teeth per minute, 56 speed variations are necessary. A speedometer is used to indicate the speed variations as they occur; this speed is controlled by means of an auxiliary cam which is so designed that the summations of circular and radial speed are constant.

Through combinations of cams, changes in the position of the pantograph legs, and substitution of various standard size driving gears, more than 5,000 types and sizes of sprockets and gears can be flame machined to a high degree of accuracy in pitch, concentricity, and contour. In addition, pinions, ratchets, and racks can also be flame machined. Only a few moments are said to be required in readying the equipment for cutting operations, and an easy change-over may be made for cutting different sizes of work. As each sprocket or gear is flame machined, the clean wearing surface of each tooth is automatically toughened in degrees determined by the characteristics of the metal itself—no further machining is necessary.

The present model of flame machining equipment is designed to handle sprockets and gears with diameters up to 4 feet, however, a model soon available will cut products over 5 feet in diameter, the manufacturer states. Sprockets to fit all classes and pitches of roller chains, detachable link chains, pintle chains,

combination chains, well-drilling chains, and so on, can be produced. Spur gears and ring gears of most types can be



Cogmatic Flame Machining Equipment in Use

matched to specifications. Sprockets up to 6-inch pitch, from 3 to 64 inches O.D. and with from 7 to 200 teeth, are said to

be accurately flame machined. Standard and special roller chain sprockets from $\frac{1}{2}$ to $2\frac{1}{2}$ -inch pitch can be made. Gears in pitch from 1 to 4 D.P., in size from 3 to 64 inches O.D., and with from 7 to 200 teeth can be cut.

The steel table on which the flame machining equipment is mounted is 33 inches high x 43 inches wide x 69 inches long. The pantograph and cam tracing parts are mounted in the rear, the cutting head being forward, as shown in the accompanying illustration.

Whale Brand Screw Driver with "Nocombo" Handle

A screw driver with "Nocombo" plastic handle which is said to eliminate fire and personal safety hazards has been added to its line of Whale Brand products by the Forsberg Manufacturing Co., Bridgeport, Conn. No more flammable than ordinary hardwood, the plastic handle, it is claimed, will not soften when warm or shatter if dropped when cold. In addition, the handle is said to be an excellent electrical insulator and to be impervious to oil, grease, and water.

According to the manufacturer, the No-

BALDOR BALL BEARING GRINDERS

A Complete Line

— 6" to 12" wheels —

BENCH and PEDESTAL TYPES

**Rugged---for heavy-duty service
Precision-built for precision work**

BALDOR Bench Grinder No. 101 — $1\frac{1}{2}$ h.p., ball-bearing motor, 1725 rpm. — 10" Aloxite wheels, exhaust type guard \$128.00 and adjustable tool rests.....

IMMEDIATE SHIPMENT — ALL SIZES

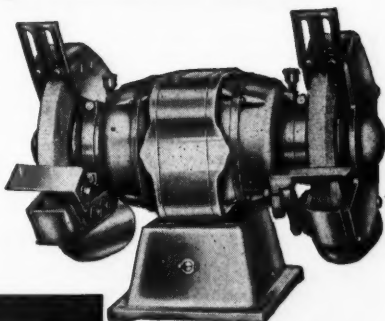
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ON COMPLETE LINE



combo handle is extruded in a design offering optimum gripping comfort and is combined with a special chrome vanadium alloy steel blade to produce a screw driver of unusual all-around strength. The screw driver can be obtained with a square-grooved or round shank blade



Whale Brand Screw Driver with "Nocombo" Handle

which is shouldered at the handle and cannot be driven into or turned in the handle, it is stated.

Carmet Grade CA-51 Alloy

The development of a sintered carbide alloy especially designed for high speed planer tools is announced by the Carbide Alloys Division, Allegheny Ludlum Steel Corp., Pittsburgh 22, Pa. Designated as Carmet Grade CA-51, the alloy can be supplied in blanks for planers utilizing

SOMETHING NEW IN A LOW PRICED ROTARY LAYOUT TABLE



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Ill.

Accurately Calibrated Through-
out the 360° of Rotation

Here is the modern and accurate tool having features obtained only in much higher priced and larger tool room equipment. The outstanding features make it an indispensable table for tool rooms and model shops. Unique design and extensive tooling makes its low price possible.

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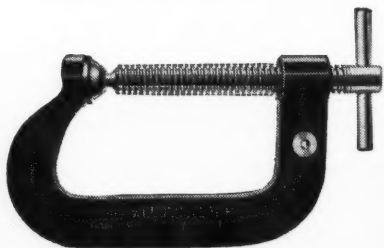
"clamped-in" or brazed-type blanks.

Carmet Grade CA-51 Alloy can also be furnished in blanks for heavy turning, boring, and facing tools, as well as for other tools requiring an unusually strong carbide.

Hargrave No. 41 Light Service Welders' Clamp

Featuring a solid alloy screw that is claimed to permanently resist spatter, a light service welders' clamp designated as the Hargrave No. 41 is announced by The Cincinnati Tool Co., 4038 Montgomery Rd., Cincinnati 12, Ohio. In addition to the anti-spatter screw which is said to greatly reduce early replacement of the clamp necessitated by spatter formation, the tool features a forged steel heat-treated frame to add to its durability and length of service.

The Hargrave No. 41 Light Service



Hargrave No. 41 Light Service Welder's Clamp

Welders' Clamp is manufactured in 2, 4, 6, and 8-inch openings. The anti-spatter screw and forged steel frame are also available on the Hargrave No. 43 Heavy Service Welders' Clamp.

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Precision Made Collets Furnished for Your Automatics, such as Peterman, Gorton, Tornos, Gibbs, Wickman, Bechler, Hager, Ceco, Etc.

Also Tungsten Carbide Guide Bushings Made to Order for Swiss Automatics.

Prompt Delivery

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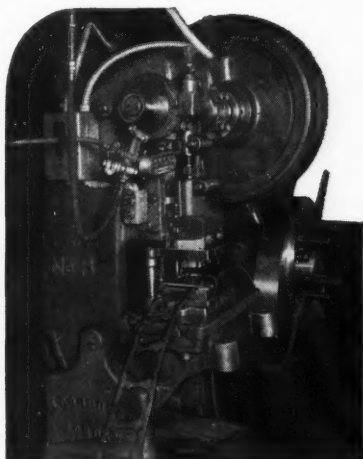
Phone Lancaster 3-3592
ROHRERSTOWN • PENNSYLVANIA

New Shop Literature

Morse-Formsprag Clutch. The Morse Chain Co., Dept. 22, 7601 Central Ave., Detroit 8, Mich., has available a 16-page two-color catalog devoted to the Morse-Formsprag Full Complement Over-Running Clutch, its construction, development, and working principle. All-purpose, indexing, and plain bearing types in a wide variety of horsepower and torque capacity ratings are covered in the catalog, which provides engineering diagrams of special designs at work with the Morse-Formsprag Clutch integrated within the designs. Copy of Catalog C11-48 free upon request.

"Surface" Clean Hardening Furnaces. Equipment for the clean hardening of steel is described in a two-color four-page bulletin issued by the Surface Combustion Corp., Toledo 1, Ohio. The bulletin depicts, with numerous illustrations, the use of "Surface" protective atmospheres for the clean hardening of various steel parts, employing the Standard Rated Balco or Char-Mo furnaces for batch processing and special furnaces for batch or continuous processing at very high production rates. Performance data in typical installations are presented, together with a chart showing the hardness gradients across sections of work heat treated by conventional processes compared to "Surface" protected work. Copy of Bulletin No. S.C-138 free upon request.

AAF Electro-PL Electronic Air Filter, which consists basically of an electronic precipitator without an ionizing unit and contains a collector element of electrostatically charged Airmat paper, is fully illustrated and described in a 12-page bulletin published by the American Air Filter Co., Inc., 215 Central Ave., Louisville 8, Ky. In addition to complete information on the construction features and advantages of the filter, the bulletin contains suggested specifications, installation data, and other helpful material. Copy of Bulletin No. 257 free.



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Elkhart, Ind.

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Shapemaster Engraver, a lathe which is designed to reduce the time-consuming art of hand engraving to the speed and repetitive accuracy of machine tool operation, is the subject of a six-page two-color illustrated bulletin published by The Monarch Machine Tool Co., Sidney, Ohio. The bulletin fully discusses the operation and application of the machine and presents its specifications, in addition to illustrations of typical parts produced on the unit. Copy of Bulletin No. 2502 free upon request.

ADVANCE CLAMPS

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on

JIGBORERS

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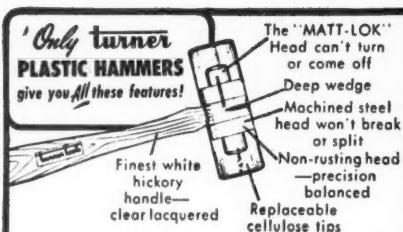
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Head can't turn
or come off
Deep wedge
Machined steel
head won't break
or split
Non-rusting head
—precision
balanced
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Time Saver Table. A catalog incorporating a unique "Time Saver Table" has been issued by the West Coast Aero Tool Co., 5401 Fountain Ave., Los Angeles 27, Calif. The table enables the user to determine quickly the number of parts which may be made from a given amount of material, thus speeding machine shop operations and eliminating waste. To use the table it is necessary only to know the length of the part and the width of the cut-off blade to be used. By adding these together and finding that dimension on the table, the number of parts which may be cut from one, ten, or a hundred feet is clearly indicated.

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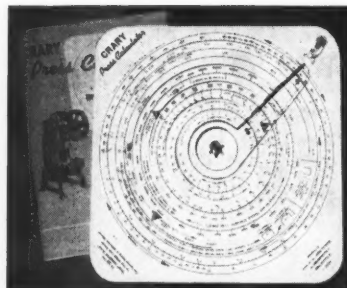
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T.A.C. Open-End Ratchet Wrench for use on pipe, tube, conduit, cable, and rod fittings is pictured and described in an eight-page pocket-size two-color folder issued by the C. J. Hendry Co., 27 Main St., San Francisco, Calif. Typical uses of the wrench are illustrated and explained. Copy free upon request.

Ohmstede Model SC-42 Shape Cutting Machine for cutting an unlimited variety of shapes is illustrated and described in an eight-page two-color catalog prepared by the Ohmstede Machine Works, 897 N. Main St., Beaumont, Tex. Specifications of the machine are included. Copy free upon request.

"Allegheny Metal in Chemical Processing." Publication of the fifth in its series of booklets on the role of stainless steel in various industries, "Allegheny Metal in Chemical Processing," is announced by the Allegheny Ludlum Steel Corporation. Up-to-the-minute facts and figures have been compiled on the use of stainless steels in chemical processing, acid manufacture, general processing, plastic making, and so on. Each chapter is fully illustrated. Charts listing physical, fabrication, and other data on the various recommended grades of stainless steel are included in the booklet, along with other information valuable to the engineer.

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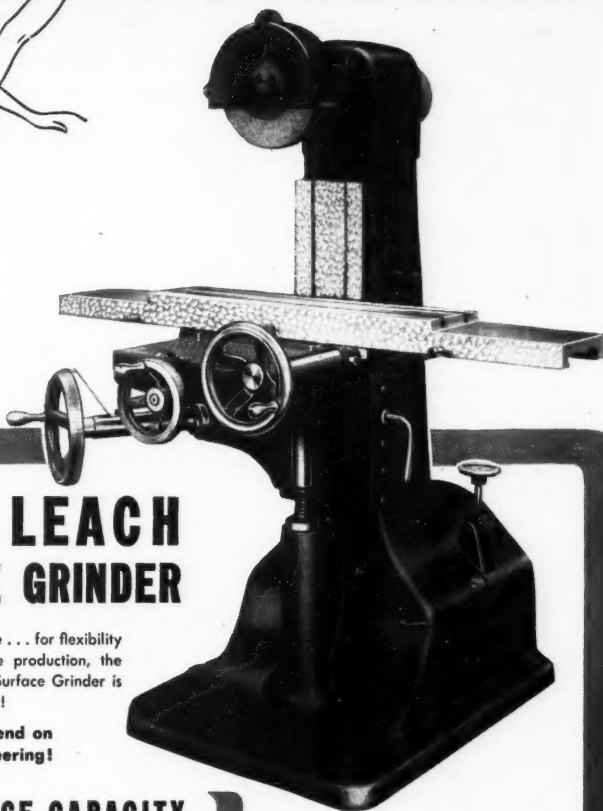
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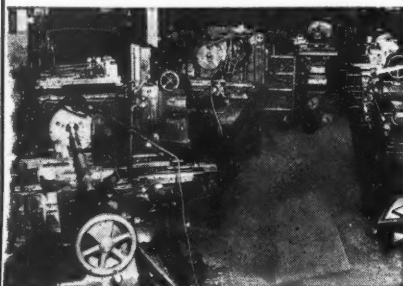
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Collets and Carbide Bushings. A line of imported headstock collets and adjustable carbide bushings for Swiss type screw machines is shown and tabulated in a six-page pocket-size folder prepared by the G and D Sales Co., Dillerville Rd., Lancaster, Pa. Prices of the various collets and bushings are included. Copy free upon request.

Diamonett Model 47-B Lens Curve Generator, which can be used for both precision and ophthalmic production, is illustrated and described as to construction and operating features in a four-page two-color folder issued by the Penn Optical & Instrument Co., Pasadena, Calif. Specifications of the unit are also listed. Copy free upon request.

Farrel-Birmingham "Equipment News." Published by the Farrel-Birmingham Co., Inc., Ansonia, Conn., this four-page two-color bulletin features an article on a new mill for rolling commutator bars. Data are also presented on an uncoiling mandrel used in re-rolling semi-finished strip and on vertical type coilers built to coil non-ferrous hot rod from an extrusion press. Copy of Bulletin No. 27 free upon request.

Coated Abrasives. A 24-page catalog containing list prices and general information on coated abrasives has been published by the Michigan Abrasive Co., 1111 Bellevue Ave., Detroit, Mich. Data are presented on aluminum oxide, garnet, and silicon carbide rolls, papers, belts, discs, and sheets, as well as on flint paper reams, emery cloth reams, lapping compounds, and special compounds. In addition, a grading chart showing comparable symbol numbers and screen sizes of grits is included.

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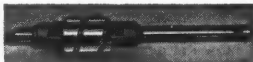
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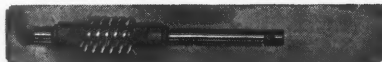
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Elgin Sapphire Products. The Sapphire Products Division, Elgin National Watch Co., Aurora, Ill., has prepared a two-color four-page circular which provides descriptions and prices of the company's sapphire plug gages, ring gages, and micrometers. The circular also describes the new "Tipt-Type" Sapphire Gage—an instrument with approximately $\frac{1}{4}$ -inch sapphire tip metallurgically bonded to the leading end of the steel member. Copy free upon request.

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Invincible Flux Recovery Equipment. A six-page two-color folder illustrating and describing flux recovery equipment for submerged arc welding has been released by the Invincible Vacuum Cleaner Mfg. Co., Dover, Ohio. The folder fully covers the advantages of such equipment, basic features of design, models available, and typical installations. Copy free.

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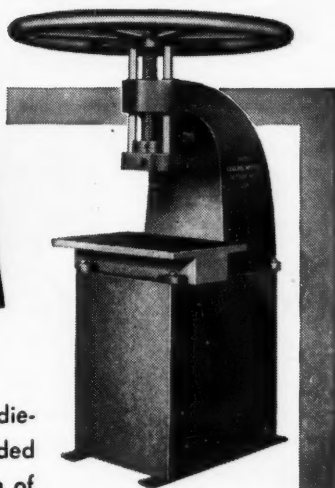
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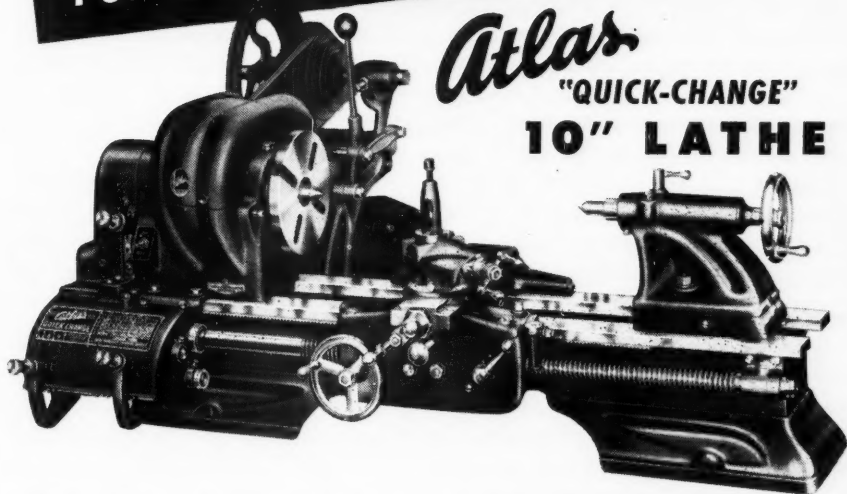
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Over the Editor's Desk

What Price Peace?

AS we go to press with this October, 1948 issue of MODERN MACHINE SHOP the people of America are tense, watching and listening for the latest news from Europe and wondering whether the next few hours will bring war or peace.

For nearly 175 years the American people have breathed the air of freedom. This freedom was not cheap; indeed, it was bought at a cost of thousands of lives and has been preserved for us at the cost of hundreds of thousands more. Twice within a generation has America had to fight countries on the other side of the earth to maintain freedom for its people, and the shadow of war is again darkening our land. If America is forced to fight again, this time the freedom and peace and security and happiness of practically all mankind will depend upon the outcome. This time the fight will determine whether our world is to live henceforth in an atmosphere of hate, and suspicion, and fear, and semi-slavery, or whether it is to go forward in the sunlight of peace and freedom.

But aside from the shadow of the war cloud, the American people are under strain. A general feeling seems to exist that our civilization has come to a fork in the road; that the world that we know is entering upon a new course—a course that will lead either upward into an age of unprecedented peace and prosperity, or that will lead downward into chaos, and perhaps bring our civilization to the brink of complete disaster. We watch the moves made by our government officials; we criticize; we suggest; we call for changes in the administration—and withal we feel utterly powerless in the presence of forces which we can neither understand nor control.

Seduced by a brilliant schemer and master salesman, during the dozen years just passed our legislators allowed the control of our government to slip from their hands until now, as Felix Morely tells us, "Administrative law, already dangerously developed, could with little change become government by outright decree. The one party system, already advocated by many who are not consciously fellow travelers, might take permanent root. The United States could easily become a single authoritarian, totalitarian state."

Realizing that we are beset by the forces of evil and selfishness both at home and abroad, we wonder if there is anything that could be done to stave off the impending calamity. There is—but it will necessitate a complete revolution in the thinking of millions of people. The history of civilization is the story of one nation after another

that has enjoyed great prosperity, then become selfish, avaricious and evil and has had to pay the penalty of a national disaster for its sins. That was the history of the Israelite nation, the Babylonians, the Greeks, the Roman Empire, the Spanish Empire, France and Germany. The Russian government will be permitted to carry on only until it has served its purpose, then it will be removed.

But what is happening to America? Why this strain on our national currency, with the threat of a possible financial collapse, and why this threat of what must be a completely disastrous war? We might begin the search for an answer by examining the trends in our national thinking in recent years.

If we are honest with ourselves we will have to concede these truths: (1) Millions of Americans are more concerned with getting more of the world's goods for themselves, increasing their own incomes at the expense of their neighbors, and with doing as little work as possible in return than they are with the welfare of the nation as a whole. (2) Too many groups, by organizing to bring political pressure, are forcing higher incomes for themselves at the expense of their neighbors. Witness the unholy machinations of the "silver bloc" of legislators from the western mining states who have forced the price of silver up to a point out of all relation to its natural value. Witness the successful drive of the farm lobby to get a "floor" established under farm produce prices, which has resulted in American taxpayers paying millions of dollars for farm products which were destroyed because there was no market for them.

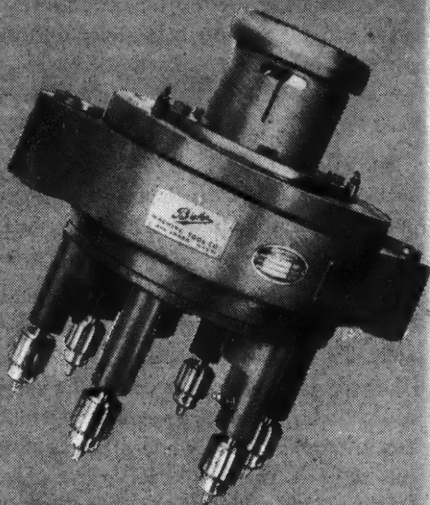
These are a few of many evils which, if not checked, will ultimately bring about national catastrophe. The fate of our nation depends in the long run upon our national character, and honesty is as important to our national character as freedom is to the nation. Unless our tendency toward selfishness is replaced by an honest effort to be as fair with our neighbors as we expect them to be with us, national freedom will not survive.

Howard Campbell

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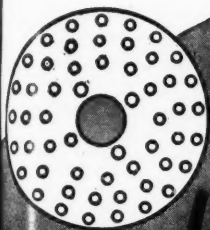
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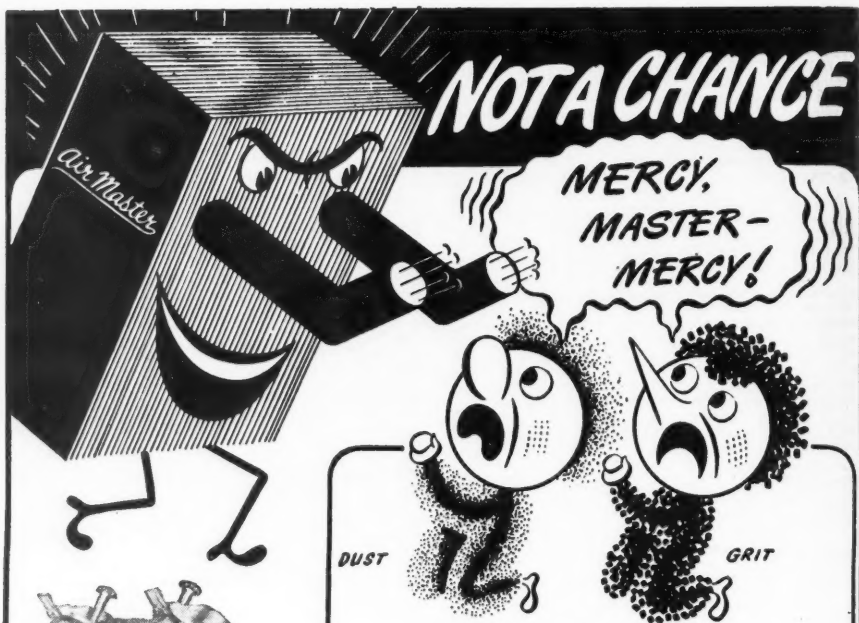
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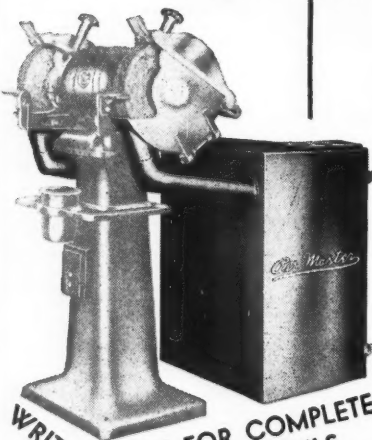
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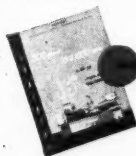


*Shift over 300 speeds
with this lever on the new
16" LeBlond Model RT Tool Room lathe*

Never before have so many important new advantages been built into one tool room lathe as on the new 16" LeBlond Model RT. With the variable voltage headstock you can shift over 100 speeds in each of three ranges without stopping the spindle. With the universal quick change box you select from the greatest range of threads, leads and feeds.

The 4-directional power rapid traverse moves carriage, cross slide, and tailstock electrically. One-piece apron with single lever length and cross feed control . . . thrust-lock tailstock with spindle travel dial . . . automatic lubrication throughout headstock, feed box, and apron . . . and many other advantages are included as standard.

There's a place in every modern plant for the new Model RT, the production tool room lathe. Maybe there ought to be one in yours?

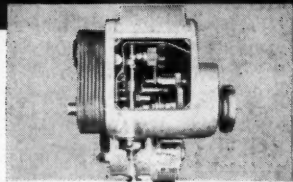


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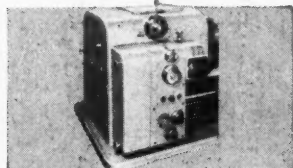
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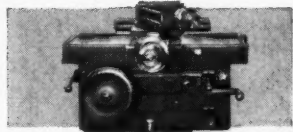
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UNIVERSAL QUICK CHANGE BOX offers widest possible range of threads, leads and feeds.



ONE-PIECE DOUBLE WALL APRON with positive jaw feed clutch and automatic lubrication.



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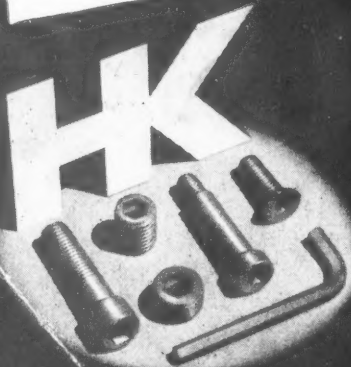
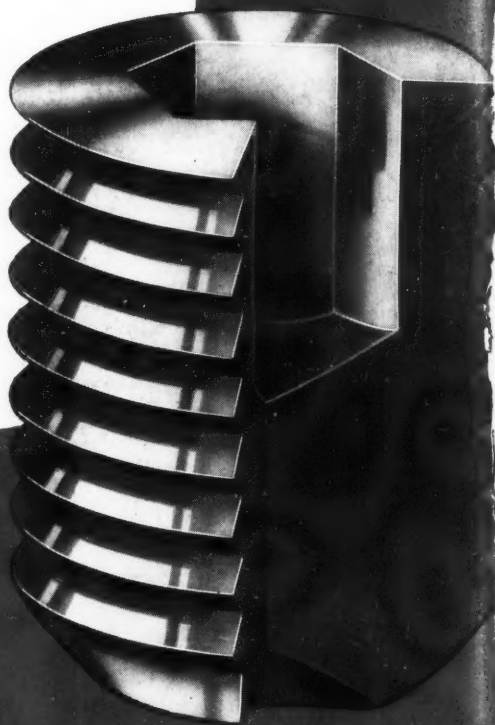
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**"BUILT-IN" FEATURES ASSURE
PERFECT PERFORMANCE EVERY TIME!**

1. **METHOD** — The exclusive Holo-Krome patented process of completely cold forging.
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